PERSONALITY AND PSYCHOPATHOLOGY

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ABSTRACT

The assessment of personality provides the clinician with an opportunity to gather idiosyncratic information about an individual; information that is potentially useful in the diagnosis, treatment, and prognosis of that patient. In the area of psychopathology, personality has been viewed historically within the context of categorical diagnoses of personality disorder. This thesis critically reviews a recently proposed theory of personality that has incorporated normal and abnormal personality into a dimensional system of classification. The biosocial theory of personality and in its expanded form, the psychobiological model of temperament and character, were proposed by C.R.Cloninger and his colleagues in an attempt to provide a theoretical base from which to test causal hypotheses about personality in psychopathology. The theory is discussed in terms of its relevance to the understanding of personality structure, development, and psychopathology. It is concluded that despite limitations, this theory has an important contribution to make to further research investigating the influence of personality variables in a clinical setting.

CHAPTER 1
Personality in the clinical setting

1. THE IMPORTANCE OF PERSONALITY INFORMATION:

The concept of personality has fascinated theorists, from the early philosophers through to today's personality psychologists. Throughout history theorists have proposed new explanations and definitions of the term, to the extent that each writer tends to develop their own idiosyncratic definition of personality. It is a topic, however, that remains strangely elusive in the face of this extensive history of theorising and research. Despite countless attempts to explain and predict personality variation, the field is still lacking in fundamental areas. As one writer stated, there seems to be a large gap between what is written in the literature and what actually presents to us in everyday life, both as clinicians and in our general dealings with society (Pervin, 1985).

The assessment of personality is often thought to be the specialist domain of psychologists. Such a view neglects the reality that most members of society constantly assess the personality of those with whom they come into contact. The vast language of personality descriptors (which has long been disparaged because of its contribution to confusion in the field) is testimony to the importance of the construct in our society (McCrae & John, 1992). Just as lay-persons intuitively assess personality in all of their social dealings, psychologists and psychiatrists assess personality in all of their patients. The difference lies in the scientific tools and knowledge that the clinician brings to the situation.

It is possible, however, that the majority of personality assessment undertaken by clinicians is carried out intuitively, using much the same methods as the lay-person. Despite the vast array of personality questionnaires, schedules, structured assessments, projective tests and other tools, clinicians often gather personality material in an unstructured way. It follows from this that clinicians use this information in a similar manner, implicitly translating it into an idiosyncratic protocol for their dealings with each patient. It is this intuitive process of data-gathering and utilisation that occupies the gap between research and everyday practice.

Of course, not all personality information is gathered informally. Psychologists and psychiatrists during the last century have developed many different methods of gathering and measuring personality information. Widiger and Frances (1985) state that the approach of psychologists to personality theory, measurement, and classification, has been quite different to that of psychiatrists. While the focus of psychologists has been the psychometric measurement of dimensional personality variation in the general population, psychiatrists have concentrated on the categorical classification of personality pathology in clinical populations. For many years these two fields of research have remained separate with little or no interaction between them. Even the field of clinical psychology has only recently begun to integrate information from the two.

In the psychopathological literature, personality disorders have commanded more attention than has the influence of personality per se. Information about personality pathology is inevitably assessed at a more concrete level, simply because in many cases it is impossible to ignore. As Perry and Vaillant (1989) have stated, "patients with personality disorders continually demonstrate to mental health professionals the limits of their expertise. They crowd the rosters of clinic dropouts, of treatment failures and of referrals to other

agencies" (p. 1352).

As a result, it is the study of personality disorders that has prompted recognition of the importance of personality information in the field of psychopathology. Evidence that the amount and type of preexisting personality problems can influence the predisposition, course, and treatment response of various psychopathological disorders has forced a reconsideration of personality influences on mental disorders (Frances, 1980; Hyler & Frances, 1985; Reich & Green, 1991). Despite a recent increase in clinical and research interest, however, the interaction of personality and psychopathology remains a complex topic with a great deal more questions than answers. Some of the major difficulties in the area of personality disorders will be discussed in this introduction. Historically, these problems have inspired only criticism and rejection of the concept, but recently there appears to be a new sense of enthusiasm as researchers attempt to solve or alleviate them.

The concept of personality disorder itself remains controversial, but at the same time it is clear that personality information is considered an essential component in mental health assessment. This has necessitated a shift of focus toward discovering the best way to conceptualise and use such information. This thesis will discuss these issues from the perspective of clinical psychology. First, four of the major topics of debate surrounding the personality disorders will be discussed as an introduction to the difficulties researchers and clinicians face when working in this area. Later, in order to limit the coverage of what is a vast area of theory and research, discussion will focus on a recently proposed theory of personality. This theory will be critically examined as an illustration of how models of personality structure can assist our understanding of the interaction of personality and psychopathology.

2. LACK OF STANDARDISED MEASUREMENT:

For many years knowledge of the personality disorders was confined to clinical anecdote. Classification depended largely on the clinician's theoretical biases and the influence of respected experts working in specific areas, such as Cleckley's (1975) descriptions of the psychopathic personality, and Kernberg's (1975) portrayal of the borderline and narcissistic personality structures. Many of the established theories of personality disorder were grounded in the psychoanalytic tradition (Kernberg, 1975; Kohut, 1971), yet competing theories proposed different variations of the disorders, each with a separate label and varying in terms of their underlying aetiology. While these descriptions were rich in their portrayal of specific personality disorders, they provided little standardisation for clinicians working with such individuals.

As a result of this historical precedent, personality diagnoses came to be seen by many as diffuse and unreliable. The categories and labels used were considered to be arbitrary, and little sound research evidence existed to clarify the reasoning behind their proposed origins and structure. In the 1960's and 1970's, personality disorder became a clear example of the deleterious effects of psychiatric diagnosis, as argued by theorists such as Szasz (1961). In many cases, it was argued, the person's inability to fit into society was what resulted in the diagnosis, rather than any inherent disorder or problem the patient had. Others believed that such criticism was misguided. Kendell (1975), for example, maintained that it is not the diagnosis itself that creates prejudice against patients, but rather the fact that the patient is indeed, "crazy, or manipulative, or unable to cope with the demands of everyday life" (p. 8). He argued that if labelling is involved at all, it is the situation of being a psychiatric patient that is important to the individual and society, rather than a specific diagnosis.

This debate resulted in a reconsideration of the methods of classification used at that time. The task was to increase the reliability and applicability of psychiatric diagnosis and classification to meet the needs of a changing field of mental health. The American Psychiatric Association's answer to this challenge was the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) first published in 1980. Four major innovations were included in the DSM-III that, although rejected by some, were seen by the majority to be a vast improvement in psychiatric nosology (Spitzer, Williams, & Skodol, 1980).

The first of these improvements was the provision of operational definitions of disorders that were descriptive and empirical, in order to avoid controversy over aetiology. The second was a revision of the grouping of clinical syndromes so that disorders were grouped together according to underlying themes, such as the affective disorders, for example. Third, and related to each of these decisions, was the introduction of a new nomenclature. Theory (and controversy) bound labels such as neuroses were discarded in favour of new, less controversial labels such as somatoform disorder. Finally, a new multiaxial format was introduced that allowed the recording of information relevant to the clinical syndromes and to enable a comprehensive assessment of the individual (Williams, 1985). The clinical syndromes were placed on the first axis, while the second was reserved for the personality disorders and specific developmental disorders. A third axis recorded physical disorders or conditions, and these three constituted the formal diagnosis of a psychiatric patient. In addition, two further axes were provided for use in special clinical and research settings to measure severity of psychosocial stressors (Axis IV) and assess adaptive functioning (Axis V).

The impact of the DSM-III was perhaps most striking in the area of personality disorders. The decision to place personality disorders on a separate axis demonstrated a recognition of the importance of information about

personality pathology. By separating personality disturbance from other Axis I disorders, the stable and enduring nature of the personality disorders was highlighted, and clinicians were encouraged to pay more attention to their influence on primary disturbances such as major depression or the anxiety disorders (Spitzer et al., 1980). The extent to which the utilisation of the personality disorder diagnosis was influenced by the new system is indicated in a study of the impact of the DSM-III on diagnostic practices which found a twofold increase in the number of personality diagnoses after the introduction of the new system (Loranger, 1990).

The advent of the DSM-III also had implications for those researching the personality disorders. The historical lack of standardisation and reliability of personality diagnosis had left researchers unsure as to whether their research was comparable to others due to the differing definitions involved. The DSM-III gave researchers a common language and resulted in an immediate upsurge in research interest in the area. Following from this the number of research articles concerned with personality disorders has increased greatly since the introduction of the DSM-III (Loranger, Lenzenweger, Gartner, Susman, Herzig, Zammit, Gartner, Abrahms, & Young, 1991).

3. FOCUS ON CATEGORICAL DISORDER:

While the DSM-III helped revolutionise the classification of mental disorder, the system was readily acknowledged to be far from perfect. Several major difficulties still exist within the system, and the section on the personality disorders is seen to be one of the most problematic. Many of these problems are believed to stem from the emphasis on mutually exclusive categories of

personality disorder in the DSM-III and its revision (DSM-III-R) (American Psychiatric Association, 1987). Historically, the field of mental health has considered personality only in terms of disorder, and because mental disorder has traditionally been defined in a categorical manner, so too have the personality disorders. Such a conceptualisation views personality disordered individuals as qualitatively different from those with normal personality structure.

The categorical conceptualisation of personality pathology has resulted in many classificatory problems. Personality disorders are rarely manifest in a single clear-cut diagnosis, and it has been demonstrated that multiple personality diagnoses are the rule rather than the exception (Pfohl, Coryell, Zimmerman, & Stangl, 1987). In addition, this overlap does not appear to be random, with some diagnoses systematically overlapping with others. For example, borderline personality disorder is rarely found by itself, and is often difficult to distinguish from histrionic, antisocial and narcissistic personality disorders (Tyrer, 1988).

There are also difficulties distinguishing between personality pathology and other disorders. Hyler and Frances (1985) describe four ways in which the two can interact; (a) personality disorder may predispose to an Axis I disorder, (b) a chronic and mild Axis I disorder may look like an Axis II disorder, (c) the disorders may be different expressions of the same aetiology, or (d) they may occur coincidentally. They conclude that whichever of these alternatives is the case, personality problems have a dramatic impact on the course and treatment of an Axis I disorder and as such, deserve further investigation.

Categorical diagnoses of personality disorder represent one small part of the wealth of personality variables that may impact on the individual's functioning. Subthreshold conditions and adaptive personality traits are two

types of information that are lost when categorical diagnoses are used. Growing discontent with the categorical diagnosis of personality disorders has led to several researchers suggesting that the system be replaced with a dimensional one. A dimensional approach to classification views personality disorder as an extreme manifestation of normal personality traits, rather than qualitatively different as a categorical system implies. Opposition to the introduction of a dimensional system still exists, however, and this debate will be discussed more fully in chapter two.

4. PROBLEMS IN TREATMENT:

Perhaps one of the most important problems in the area of personality disorders is the lack of successful treatment options. Gorton and Akhtar in their 1990 review of treatment issues could only echo the words of Widiger and Frances (1985), who five years earlier had stated, "one can justifiably argue that a discussion of the treatment of the personality disorders is premature . . . and there is no body of systematic research on the optimal treatment of personality disorders" (Gorton & Akhtar, 1990, p. 46; Widiger & Frances, 1985a, p. 621). The few partially successful treatments described in the literature are usually very intensive, requiring large amounts of resources to produce small gains (Kernberg, 1984; Kohut, 1971; Vaglum, Friis, Irion, Johns, Karterua, Larsen, & Vaglum, 1990). As a result, many clinicians feel limited in their knowledge of and ability to provide adequate treatment for individuals with these disorders.

Personality disorders are by definition made up of enduring personality traits that are inflexible and maladaptive. This definition compounds the problem

of perceived untreatability as it assumes that personality disorder is stable over time, therefore unchanging with or without treatment. It is well known that a personality diagnosis tends to follow a patient and that such diagnoses carry negative connotations. Relatively recent research shows that psychiatrists form pejorative, judgemental, and rejecting attitudes toward patients with a previous diagnosis of personality disorder, and that these patients are perceived as less deserving of care than those without such a diagnosis (Lewis & Appleby, 1988). The reasons for such attitudes are complex but it is likely that the lack of effective treatment options is an important factor.

It is understandable that clinicians are reluctant to treat clients they feel powerless to help. However, the most serious result of assumptions such as these, is a therapeutic nihilism that extends into the future as well as complicates the past. Without adequate treatment trials for personality disorder or research into the nature of the difficulties involved in such treatment, these patients have been deemed untreatable, and the negative attitudes towards such patients have been allowed to perpetuate. Until recently, this has resulted in the neglect of personality disordered patients as well as those who display tendencies toward such diagnoses. Outcome research measuring personality disorders has generally focused on their influence on the treatment of Axis I disorders, rather than the treatment of personality disorders per se (Reich & Green, 1991).

There is no doubt that those with personality pathology are difficult to treat, nor is there any use denying that such individuals have "a peculiar capacity to 'get under the skin' of and distress others" (Perry & Vaillant, 1989, p. 1352). Clinicians and researchers are not immune to the frustration and despair that surrounds such patients, this much is obvious. What is not so obvious is the more subtle features of neglect that these feelings evoke in the most

conscientious clinician. These problems do not excuse us from the task of investigating why it is that these patients are so difficult to treat and what can be done to improve treatment options.

A recently published study, however, indicates that some attempts are being made to do treatment outcome studies in the area of personality disorder (Stevenson & Meares, 1992). Using DSM-III diagnoses, objective outcome measures, and a prospective design, these researchers were able to demonstrate that a well-defined outpatient psychotherapy resulted in statistically significant improvements in patients with borderline personality disorder at the end of treatment and at one year follow-up. While the results of this study should be considered preliminary, given the lack of a control group and the fact that 70% of their subjects retained their diagnosis at follow-up, it demonstrates that improvements following treatment do exist and can be measured objectively.

5. LACK OF THEORETICAL BASE:

Many of the problems already mentioned are related to the descriptive nature of the current classification of personality disorders. As Kendell (1988) has stated, the personality disorders remain, "a jumble of overlapping clinical concepts unrelated to theories of personality development or to the dimensions of personality identified in normal populations" (p. 1302). The committees who devised the DSM-III and DSM-III-R make no apologies for the fact that theoretical hypotheses were omitted. In fact, they had deliberately set out to avoid using constructs identifiable as belonging to a particular theory in order to make the manual acceptable to as large a group of

clinicians and researchers as possible.

This rejection of theory in the new classification appears to have its roots in the rejection of psychoanalytic theory as untestable and unscientific. From this, an impression was formed that theory is narrowly conceived, controversial and therefore detrimental to the acceptance of a classification system. As Carson (1991) states, however, this assumption ignores several important factors. Clearly, some theories are better than others and to reject all theory on the basis of bad experience with one seems foolish. In addition, it is difficult for such a classification system to avoid making theoretical assumptions. Morey (1991) highlights the results of recent research in cognitive psychology which demonstrates that humans organise concepts by using theories about the world, rather than on the basis of superficial similarities. Classification systems that reject theory, therefore, run the risk of conceptual confusion.

An example of the kind of conceptual confusion that can result is found in the definition of personality disorder in the DSM-III-R, which includes the words 'chronic' and 'pervasive'. Despite the emphasis on operational definitions in the DSM-III and DSM-III-R, however, there is no explanation as to what these words mean (Tyrer, 1988). This lack of clarity has had important implications for the distinction between Axis I and Axis II disorders. Schizotypal personality disorder was once labelled simple schizophrenia. Due to its chronicity and pervasiveness along with the absence of clear psychotic features it was moved to the personality disorders section. Cyclothymia, in contrast, was once considered a personality disorder for similar reasons, but is now placed with the affective disorders. Such contradictions result from the lack of a clear theoretical base identifying the core constructs of the personality disorders that distinguish them from other disorders.

One of the most important assets of a theoretical base, however, is its

explanatory potential. A theory based classification of personality disorders would emphasise common causal principles that can also predict important associations, such as response to treatment and interaction with other disorders. Such information provides a useful guide for both researchers and clinicians, enabling insights that may not otherwise be recognised (Millon, 1991). In addition, a theory need not be restricted to one particular approach or perspective. The value of interaction between different fields of research is being acknowledged as critical in the development of new scientific paradigms (Holzman, 1985). In a similar way, theories of personality disorder would benefit from the integration of research from a wide range of fields other than psychiatry, such as personality psychology, learning theory, genetics, and psychopharmacology.

Epstein (1987) has added a caveat to this recent enthusiasm for a theoretically based classification system. He states, "where adequate theory is available, it provides the most desirable basis for diagnosis. However, adequate theory is often not available, and an empirical approach is clearly preferable to one that is based on poor theory" (Epstein, 1987, p. 108). There is no doubt that there has been a historical lack of testable causal theories of personality disorders. This does not, however, exclude it as a goal for the future.

This thesis argues that personality information is an essential component of our understanding of patients in the field of psychopathology. For many years such information has been neglected due to the problematic nature of the concept, and the difficulties surrounding the description, measurement and treatment of personality disorders. In order to overcome these difficulties, clear and integrated theoretical work is needed from which we can begin to answer these questions. To manage this successfully, theoretical hypotheses need to incorporate past research findings in the area and provide opportunities for further research. A recently proposed personality theory has

attempted to achieve this, and it will be the focus of discussion throughout this thesis. It is by no means the only adequate and interesting theory available, but it is an innovative and integrative approach that has attracted the attention of researchers from many different fields. For these reasons it is a useful base from which to discuss the role of personality in psychopathology.

CHAPTER 2
Classification in Psychopathology

1. INTRODUCTION:

1.1 OVERVIEW:

Diagnostic models are thought to shape the direction of theory, research, and treatment in psychopathology (Strauss, 1973). It is not surprising, therefore, that one of the most prominent debates in the classification of psychopathology currently centres around the choice of a structural model most suitable for this task (Frances, 1982; Gorton & Akhtar, 1990; Gunderson, Links, & Reich, 1991; Livesley, 1985; Robins & Helzer, 1986; Widiger & Kelso, 1983; Widiger & Trull, 1991). The DSM-III-R, which is the most commonly used system at the present time, follows the traditional medical model and uses a categorical system. In medical disorders, syndromes are classified largely by causal properties. In psychopathology, however, our knowledge of causality is limited and what we do know suggests multiple causal agents rather than single ones.

The lack of causal hypotheses is one of several problems that have led to the gradual erosion of the categorical model in psychopathology. Polythetic criteria have replaced monothetic in the DSM-III-R, severity ratings have been included, and some categories are seen to be more "fuzzy" or prototypal than distinct. All these changes indicate a trend toward the gradual demise of distinct categorical boundaries (Widiger & Trull, 1991). In addition to these changes, there has been a growing acceptance of dimensional perspectives,

particularly in the area of personality disorders. Although the dimensional-categorical debate has been most prominent in this area, dimensional perspectives are also being developed in childhood, psychotic, dissociative, substance use, anxiety, and mood disorders (Widiger & Trull, 1991).

While some still assume that the current system provides an accurate framework and that correction of the details is all that is required, the majority of researchers have no illusions that current efforts in this area are to be the final word. The DSM-III-R is instead considered to be an appropriate tool by which to gather information so that it may be replaced with newer, more effective classificatory systems in the future (Carson, 1991; Frances, First, Widiger, Miele, Tilly, Davis, & Pincus, 1991).

This chapter discusses several of the major issues concerning the classification of psychopathology, using the personality disorders as a focus wherever possible. After a brief historical introduction to the area, the rationale for using a classification system in psychopathology is discussed. In order to clarify the underlying assumptions of different classificatory systems, three methods of construction are examined, before reviewing the recent debate concerning the advantages and disadvantages of the categorical and dimensional models of classification. Finally, models that attempt to combine the benefits of the two systems are discussed, with special reference to the temperament-character model of personality.

1.2 HISTORY OF PERSONALITY CLASSIFICATION:

Attempts to classify personality can be traced back to the ancient Greeks. The philosopher Empedocles declared that all substances were composed of the universe's four basic elements; earth, water, fire, and air; and in doing so

demonstrated an early desire to look beyond surface appearances to a more fundamental structure. Epstein (1987) notes that while these particular elements may have been wrong, the notion of basic elements was sound, and ultimately resulted in the impressive classificatory system now known as the periodic chart. These four basic elements were not restricted to the description of physical structures alone, and in the fourth century B.C. Hippocrates related them to four bodily humours (yellow bile, black bile, blood, and phlegm). He stated that any excess or imbalance in these would result in disease. Elaborating on this further, he identified four basic temperaments that were related to these bodily humours; the choleric, the melancholic, the sanguine, and the phlegmatic; and hence the first recorded system of personality classification (Millon, 1981). Not all of the ancients adhered to a personality structure based on a set of fundamental elements. Recorded in the writings of Aristotle is an attempt to identify personality characteristics according to outward appearances, a system that has also been popular throughout history.

It is clear that the classification of personality and its disorders is neither original, nor straight-forward. In spite of this, the desire to explain personality and its relation to the world has led many to attempt to find ways of grouping them. In a historical summary of the different personality classification systems, Millon (1981) lists the early twentieth century theorists who conceived of personality in terms of character propositions, temperament hypotheses, and psychiatric conceptions; along with more modern formulations such as constitutional models, temperament dimensions, factorial categories, psychiatric syndromes, psychoanalytic theories and character types, the life-style types of Jung and Adler, interpersonal orientations, learned coping patterns, and finally, the DSM-III and DSM-III-R personality disorders.

2. THE PURPOSES OF CLASSIFICATION:

Classification is an essential component of information processing (Medin, 1989; Rosch, 1978). Rather than describe the detailed characteristics of each object or phenomenon, humans are able to communicate simply by using the relevant category label. By classifying phenomena, it is possible not only to understand each phenomenon in relation to the group to which it belongs (what it is), but also in relation to other differing groups (what it is not). Classification allows us to communicate a vast body of knowledge with ease and efficiency.

Clinicians in the area of psychopathology, somewhat controversially, have chosen to follow medicine's lead in its choice of classification model, despite the paucity of knowledge regarding causality. In medicine, classification implies diagnosis. In psychiatry, diagnosis without knowledge of causality incites controversy. In his book,*The Role Of Diagnosis In Psychiatry*, Kendell (1975) acknowledges that psychiatric diagnoses have serious shortcomings. Attaching a label to a condition can, he says, encourage a false sense of understanding at the expense of thorough questioning of alternative hypotheses (Kendell, 1975). From the other extreme, diagnoses often seem inadequate to explain the complex nature of each patient's situation. Kendell cites Menninger who argues that the only proper alternative to diagnosis is a unique and detailed formulation of each patient. Kendell argues that while this is essential information for an understanding of that patient, it cannot replace the concise summary of a diagnosis which enables the clinician to set some kind of limits on assessment, treatment and prognosis.

To demonstrate the value of diagnosis, Kendell (1975) lists aspects of each individual that are important regardless of context or illness:

1. those shared with all humans,

2. those shared with some, but not all, and
3. those which are unique to the individual.

If classification is to be of any value, he states, the second of these categories is the most important, for if the first and last overshadow it, a classification system would be of little practical use. For example, if all mental illness was assumed to be the same, we would unerringly apply the same treatment to all. Similarly, if every mental illness were unique to each individual, there would be extreme delays in communication and learning in the field of mental health.

In this, albeit simplified context, it becomes clear why psychiatric diagnosis is so important for communication. Even if a diagnosis gives us little in the way of definite answers about aetiology and prognosis, it does provide us with a means of exploring these questions further. It is a scientific tool that enhances our ability to investigate particular types of phenomena, and therefore our progress toward understanding those phenomena. In order to communicate effectively we need a common language. Without such a language, researchers and clinicians must create definitions of disorders according to their own research, ideas, biases, and other influences, inevitably resulting in semantic and conceptual confusion.

The debate concerning the purposes of classification highlights the need for an intricate balance between an individual case approach and a parsimonious classification system. At each extreme there are difficulties, with either too much or too little information. This depends, however, on the purpose for which they are used. In many cases it is advantageous to have both kinds of information, the classificatory system to match the individual to the world, and the idiosyncratic information to match our world knowledge to the individual. For the purposes of research and the communication of knowledge, however, it is clear that classification is an important and convenient shorthand, without which progress would be much slower.

3. CONSTRUCTION OF A CLASSIFICATION SYSTEM:

3.1 METHODS OF CONSTRUCTION:

The method of construction used for a classification system is an important indicator of the assumptions and validity of that particular system, yet it is an area that has been overlooked by many commentators (Schwartz, 1991). As Morey (1991) has stated, without an awareness of the assumptions that form the basis of classification systems in psychopathology, it is unclear how the field can advance. Clinicians and researchers need to be aware of the methods by which a classification system is constructed in order to determine the suitability of that system to their specific needs. In the past, methods of construction have rarely been made explicit. As a result, there has been a lack of clarity concerning what these underlying assumptions are and how they effect the validity of the classification system in use.

In an recent article concerning classification in psychopathology, Millon (1991) identified three different methods of construction which will be discussed here. The first of these focuses on the accumulation of clinical knowledge through the efforts of well respected clinicians and scholars, and has for a long time been the dominant method in psychiatry. In contrast, the second method of classification, that based on statistical testing, has only relatively recently been developed in this area. Third, after a period of disfavour, theory based classifications have begun to re-emerge, and their merits acknowledged.

Although each of these methods is presented separately in order of its historical relevance, it should be emphasised that they are not mutually exclusive. Skinner (1981) has suggested that each be used in the process of validating a diagnostic system. In his description of an integrated paradigm for the evaluation of psychiatric classifications, he draws on the work of Loevinger (1957), who proposed a three stage process of construct validation

for psychometric tools. The first stage involves theory formulation, the second, internal validation by statistical means and the third, external validation to evaluate predictive, descriptive, and clinical validity.

3.2 CLINICAL DESCRIPTION:

In the early stages of any classification, observation of repeated similarities is essential. In psychopathology, classification systems have for a long time relied heavily on the clinical recognition of patterns within patient samples. After careful examination of these data, categories are formed that best clarify these relationships. This method of construction generally rests on phenomenal observations and the largely intuitive conclusions of respected leaders, without the use of theoretical or quantitative approaches (Millon, 1991). The advantage of this approach is that by using observable phenomena as a basis of classification, it is unheeded by our lack of knowledge and agreement about aetiology in this domain. As Spitzer stated in the DSM-III (1980), it is possible to agree on the identification of mental disorders on the basis of their clinical symptomatology without agreeing on the aetiological basis of the disorder.

Although the types of measures used have become more sophisticated since the early classifications of Kraepelin and Freud, the current method of construction is still largely based on the steady accumulation of clinical observation and inference, and the consensus of committees. Such a system has enormous potential for cultural biases, dependent as it is on the experiences of those doing the describing. The most notorious example of this is the historical difference between the DSM I and II (American Psychiatric Association, 1952, 1968), and the World Health Organisation's equivalent, the International Classification of Diseases (World Health Organisation, 1955,

1968). In the 1950's, psychiatric patients could be miraculously cured or have a sudden change in disorder due to the act of crossing the Atlantic (Kendell, 1975).

This method is also criticised for being influenced not only by culture bound tradition but also by the political forces involved in the advancement of disciplines. It has been suggested that the DSM's are merely products of the currently reigning group of nosologists (Schacht, 1985). The DSM-I (American Psychiatric Association, 1952) and the DSM-II (American Psychiatric Association, 1968) were largely products of the dominant psychoanalytic school (Carson, 1991; Millon, 1991), whereas the DSM-III, in contrast, was subject to very different influences. For example, Hempel, a philosopher of science, in 1965 advocated "a descriptive approach that remains close to observable data, values reliability, and operationalises terminology", that in retrospect looks very much like a manifesto for the DSM-III (cited in Schwartz, 1987, p. 837). Working from a similar view point, a group of researchers at Washington University at St. Louis began to emphasise phenomenological description by diagnostic category, and published a set of diagnostic criteria (Feighner, Robins, & Guze, 1972) that is thought to have set the example for DSM-III (Robins & Helzer, 1986).

The question of politics is invariably invoked when one is dealing with official classifications that rely on descriptive methods of construction. Every stage of the process, from the selection of a chairman and committee to the final choice of criteria for each disorder is governed by a series of decisions that are influenced by both personality and position. Millon (1983) suggested after the publication of the DSM-III that many of the debates concerning that classification had more to do with school allegiance and personal prejudice than fact. It is doubtful that such influences can ever be fully eliminated. Instead both those constructing and using the system must remain constantly

aware of these influences, and their own susceptibility to them.

3.3 STATISTICALLY DERIVED CLUSTERS:

The popularity and established nature of the descriptive approach has made it difficult for other methods of classification to find acceptance in psychopathology. Advances in mathematical techniques, such as factor analysis, however, have led to the use of methods that enable researchers to see underlying similarities that could otherwise be hidden. Such methods have been developed to explore the nature of patient similarities in ways that are seen to be more objective than the clinical method. In this type of construction, large amounts of information are fed into statistical equations, then analysed mathematically to find similarities.

Millon (1991), cites Andreasen and Grove (1982) who list three advantages of the factor-analytic method. First, it enables features characteristic of the subjects to define the classification, rather than the clinicians more subjective judgement of those characteristics. Second, it is possible to process larger amounts of information than human beings are capable of at one time, and third, it can combine sets of information in more complex ways. The classic example of this kind of empirical process according to Epstein (1987), is the construction of the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943).

The selection criterion for items in the MMPI was their ability to discriminate between a diagnostic group and a normal group. Any item that did this, regardless of the reason, was included in the scale. As Epstein (1987) states, this meant that if an item such as "I like poetry" was endorsed significantly more often by schizophrenics than controls, it would be included in the

schizophrenia scale. Epstein also suggests that diagnostic tests constructed in this way, may be effective at discriminating subjects for reasons that are unknown or contrary to those proposed. This, he states, may result in the possibility of misinterpretation of causal influences, and a corresponding impediment to the understanding of such influences.

Millon (1991) points out that while these quantitative methods can be put to many uses, only a few are relevant to the construction of classification systems, and even those are of doubtful relevance when used as the sole method of construction. It is unlikely that a group of patients would be distinguished by the use of random variables without some bias or clinical inference affecting the results. In the example above, it is still necessary to have some prior way of distinguishing schizophrenics from controls in order to determine whether they like poetry more than controls do.

These types of problems have been most obvious with personality classifications obtained by factor analytical procedures. It has become clear that this method is not the objective scientific tool it was once hoped to be, as the quality of information put into such analyses inevitably determines the quality of output. Despite the sophistication of the mathematical method, subjective and sometimes arbitrary decisions determine the choice of items, factor-analytic procedures and rotations, and the ultimate labelling of the obtained factors (McAdams, 1992). In this way important constructs may be missed, but less central constructs may also be verified, in a kind of factor-analytical halo effect.

Millon (1991) cites a comment Kendell made in 1975 as being no less relevant to investigators today who have had, "a naive, almost Baconian, attitude to the statistical techniques they were employing, putting in all the data at their disposal on the assumption that the computer would sort out all the relevant

from the irrelevant and expose the underlying principles and regularities, and assuming all that was required of them was to collect the data assiduously beforehand" (cited in Millon, 1991, p.118).

3.4 THEORETICALLY DEDUCED CONSTRUCTS:

Despite the usefulness of clinical description and mathematical techniques in the classification of psychopathological disorders, it is clear that they need to be integrated into a coherent framework. Cognitive psychologists have demonstrated that without theories to interrelate concepts and structure attributes, these concepts cannot be organised coherently (Murphy & Medin, 1985). After a period of criticism of theoretically based methods of classification, resulting from the unfalsifiable psychoanalytic theories of previous classifications, many writers are beginning to acknowledge the importance of theory in the construction of classification systems (Carson, 1991; Millon, 1991; Morey, 1991; Skinner, 1981).

The advantages of a theory based classification rest largely with its explanatory potential. As Millon (1991) has stated, "theory provides the glue that holds a classification together and gives it both its scientific and clinical relevance" (p. 257). It provides clinicians and researchers with a guide to understanding certain phenomena and encourages the generation of new insights about those phenomena. Theories enable the integration of disparate concepts into a unified pattern of relations. In addition, theory based classification systems provide the means by which to assess the relevance of a system and discriminate between alternative systems.

Theories are also important in their capacity for eliciting predictions and providing direction for further investigation. It has been suggested that for

this purpose theories need be neither fully comprehensive nor extensively supported to be useful (Millon, 1991). Morey (1991) suggests that it is foolish to expect too much from a theory, and that we should be investigating specific theories about specific phenomena, rather than searching for a universal all encompassing theory of psychopathology. It is the role of theory to stimulate and guide further investigation that is most important. In order to fulfil these criteria, however, he states that a good theory should have a formally developed structure that is linked to observables, and can be adequately measured and therefore tested (Morey, 1991). Without these qualities the advantages of a theoretical base are lost and further research is often meaningless.

4. THE CATEGORICAL MODEL:

4.1 OVERVIEW:

Also known as the typological or classical model of classification, the categorical model is characterised by "mutually exclusive categories defined by a set of necessary and sufficient features" (Livesley, 1985, p. 353). All members in each category are assumed to be the same with clear boundaries between the different categories. Although quantitative differences are acknowledged, boundaries are always distinct and qualitative.

The most obvious advantages of the categorical model are its simplicity and familiarity. Large amounts of information can be communicated in a vivid and efficient way, thereby reducing information overload. The categorical model has a long history in medical and psychiatric classification systems and is consistent with both biological and psychodynamic paradigms (Gunderson

et al., 1991). It has been stated that psychiatrists naturally think in categories (Frances, 1980), and that psychologists, who ostensibly prefer dimensions, convert this information into categories anyway (Widiger & Trull, 1991). In addition, the categorical model has an ease of conceptualisation that enables disorders to be easily distinguished from one another (Widiger, 1983). In this way it is said to stimulate research to clarify these boundaries further so that we may concentrate our knowledge and better treat individual disorders.

4.2 DIFFICULTIES WITH THE CATEGORICAL MODEL:

(a) Inflexibility:

In an ideal categorical classification then, categories are homogeneous, mutually exclusive and jointly exhaustive. As several writers have discovered, however, in reality such classes are rarely found even in the seemingly more ordered parts of nature, such as the plant kingdom (Frances, 1982; Widiger & Kelso, 1983). In psychopathology, the categorical model encourages the assumption that disorders are discrete illnesses with qualitative and distinct boundaries. It implies that specific categories have specific treatments and responses, even though we may not have found them yet. These assumptions are increasingly being seen to be Procrustean and inappropriate to the complexity of psychopathological phenomena, especially in the area of personality pathology (Widiger & Kelso, 1983).

Another potential problem with the categorical model is that it reflects a more definitive consensus than actually exists (Strauss, 1975). Some suggest that it contributes to a professional sense of identity by defining a domain of expertise (Widiger & Trull, 1991), but it can also lead to "halo effects", by which an individual's similarities to the category are exaggerated and

inconsistencies ignored. Inadequate description like this can be misleading, and ultimately work to the detriment of the patient.

(b) Classification dilemmas:

Widiger and Trull (1991) make the point that the placement of what are very diverse disorders into distinct categories creates substantial organisational problems and classification dilemmas which can lead to diagnostic inconsistencies. "Wastebasket" diagnoses such as the "not otherwise specified" options are required to cover those individuals who do not fit the categories available. Boundary diagnoses such as schizoaffective disorder are needed for those who do not fit either one category or another, but include components of both. There is also the problem of overlap that necessitates multiple diagnoses, most notably in the personality disorders but also in other areas such as depression and anxiety. Related to this is the difficulty of distinguishing between what are true comorbid phenomena and what is merely overlap due to the vagaries of the diagnostic system.

(c) Arbitrary cut off points:

To define a category, cut off points are required to determine the difference between those who belong and those who do not, in this case to distinguish between disorder and normality. In the present classification system, the cut off points and frequency criteria have been severely criticised. There is little empirical or practical support for those currently being used, making them seem somewhat arbitrary (Robins & Helzer, 1986). Fixed cut off points are thought to be inappropriate for the many different settings and purposes in which the DSM system is used. Widiger and Trull (1991) suggest that different cut off points would be optimal for different base rates and validators. In addition, there is the problem of subthreshold patients who may still have significant personality pathology that will affect other diagnosed

disorders or make those patients more vulnerable to environmental stress (Gorton & Akhtar, 1990; Tyrer, 1988). At present this information is lost, and the relative costs of giving the diagnosis or withholding it are unknown (Finn, 1983).

(d) Neglect of information about strengths:

A similar loss of information occurs with the categorical model's emphasis on weaknesses and deficits. This is particularly noticeable in the area of personality where strengths may compensate for or even outweigh such weaknesses. This information is essential when gauging patient resources for treatment planning, yet is often neglected and sometimes ignored when a categorical classification system is used. For all of the above reasons the categorical nature of the current personality classification is now seen by many to be somewhat arbitrary in its distinctions between normal personality and the pathological, between personality and other disorders, and between the different personality disorders themselves (Widiger, Frances, Spitzer, & Williams, 1988).

5. THE DIMENSIONAL MODEL:

5.1 OVERVIEW:

Conceptually, the dimensional model is more complex than the categorical. It acknowledges the diversity and uniqueness of individuals, and hence the corresponding descriptive complexity that this entails (Strauss, 1973). Psychopathology is portrayed by this model as a matter of degree, rather than in terms of presence or absence, thus establishing a continuum between

disorder and normality (Widiger & Frances, 1985b). This inevitably means that boundaries are less distinct and overlap is an integral part of the model (Gunderson et al., 1991).

(a) Comprehensiveness:

One of the main advantages of the dimensional model of classification is that by using dimensional profiles it is able to communicate more specific and comprehensive information than is possible with a categorical system (Widiger & Kelso, 1983). Subthreshold conditions that may be important diagnostically can still be measured by this system, hence improving our description, and therefore our knowledge of those patients on the boundaries of normality and disorder. In addition, strengths can be acknowledged for their influence on the patient's presentation and usefulness in treatment.

(b) Measurement advantages:

For research purposes the dimensional model enables quantitative measurement of disorders rather than the more qualitative presence or absence found in the categorical model. For this reason description by dimensions is said to be more reliable and precise. In addition, complex data can be manipulated more effectively when quantified on several dimensions. For example, if a patient with major depression has subthreshold levels of anxiety disorder and personality disorder, the significance of each on a dimensional profile may be ascertained. Later, the effect of successful treatment for depression can be measured against the other subthreshold entities. A dimensional model allows examination of the relative importance of different entities in a more precise way than is possible with a categorical system.

(c) Increased complexity:

While the dimensional system provides more precise information, this is not without a corresponding lack of clarity. Frances (1982) demonstrates this by using our descriptions of colours as an example. Although dimensional description of colours using wavelength provides more precise and detailed information, it is not as vivid or simple as the categorical description of red. Frances states that other possible disadvantages of using a dimensional system are that underlying discontinuous categories may be concealed and simple relationships lost.

Related to these problems is the argument that dimensional classification is too cumbersome for everyday use (Gorton & Akhtar, 1990; Livesley, 1985). This is undoubtedly a disadvantage if it results in the system being ignored, but as knowledge progresses, any classification system is bound to increase in complexity. It is also possible to convert dimensional data into categories simply by placing cut-off points on the dimensions, if summary information is required (Grove & Tellegen, 1991; Robins & Helzer, 1986; Widiger & Kelso, 1983). The important difference between this and a categorical system is that these points would be flexible, allowing different cut-off points for different purposes, and hence avoiding the arbitrariness of those that are fixed (Tyrer, 1988; Widiger & Trull, 1991).

5.2 ACCEPTANCE OF THE DIMENSIONAL SYSTEM IN PSYCHOPATHOLOGY:

There has been a growing acceptance of the dimensional model due to dissatisfaction with the limitations of the categorical model, and an increasing awareness of the advantages provided by the dimensional approach. Despite

this, the dimensional model has never been accepted in an official psychiatric classification system (Millon, 1991). When the DSM-III-R was published in 1987, many were disappointed that an attempt had not been made to incorporate a dimensional structure into the personality disorders section. With the separation of personality disorders from the other major mental disorders, this section of the classification was seen as the perfect arena for testing the merits of a dimensional system. The Advisory Committee had considered the inclusion of a dimensional classification for the personality disorders as an appendix to the DSM-III-R, but stated that they were unable to find sufficient data on what kind of dimensional criteria could adequately define personality pathology (Widiger et al., 1988).

This lack of consensus over what a dimensional system should incorporate becomes a major issue now that the merits of this kind of system are being recognised. There is no agreement about what the dimensions should be or even how many basic dimensions should be used (Gorton & Akhtar, 1990; Livesley, 1985; Millon, 1991; Strauss, 1973). In the area of personality disorders, it has been argued that there are no obvious dimensions available that are appropriate to a classification system of personality pathology. There is, however, an abundance of research into normal personality dimensions. Widiger and Kelso (1983) list nine different theorists who have proposed dimensional personality structures, but state that this in itself is problematic due to the difficulties involved in choosing between them.

Most of those opposed to the introduction of a dimensional system conclude by stating that although this approach has merits, there is not yet enough evidence to justify discarding the familiar and established diagnostic categories with an unfamiliar and unestablished dimensional system (Widiger et al., 1988). Others warn that changes in classificatory systems that appear to be revolutionary tend to be ignored, so that any advantages of a new system

would be lost (Frances, 1982). While there are encouraging signs for the implementation of a dimensional model, there is still a noticeable reluctance to do so.

The basis of this reluctance appears to rest more with the influence of tradition than anything else. As Widiger and Kelso (1983) state, "to argue that one should continue using categories because they are the past or current method is to appeal only to inertia and tradition and does not really befit an effort to improve and advance understanding" (p. 492). It is important to continue to work on dimensional models of classification in the expectation of implementing such a system in the near future. In the meantime, awareness of a dimensional perspective guards against applying a categorical system too rigidly (Frances, 1982).

6. MIXED MODELS:

According to Frances (1982), it is often overlooked that dimensional and categorical approaches to classification are complementary rather than mutually exclusive. If it is possible to combine the two systems, their strengths may be maximised and their weaknesses minimised. Skinner (1981) proposes that mixed models also have the potential to integrate seemingly unrelated theories of psychopathology. Several models integrating categorical and dimensional perspectives have been proposed in the literature for the personality disorders, but as yet they remain relatively untested. The following section describes some of these models.

One possibility being researched involves arranging personality pathology according to a dimension measuring severity of impairment or dysfunction

(Gunderson et al., 1991; Kernberg, 1984; Millon, 1981). Gunderson and his colleagues have proposed a synthesis model in which some personality types are seen as categorical disorders that extend toward the Axis I disorders, while others are conceptualised as trait disorders that extend in the opposite direction and merge with normality (Gunderson et al., 1991). They argue that the severe personality disorders such as the schizoid and paranoid are more likely to fit a categorical model with more specific aetiological factors. Less severe disorders such as compulsive and dependent, in contrast, are better conceptualised according to a dimensional model, merging as they do with normal traits.

A different group of researchers have used a three dimensional structure to describe personality function (Torgersen & Alnaes, 1989). By dichotomising each of their three personality dimensions and placing them in a hierarchical structure they were able to create a diagnostic decision tree. Using this decision tree, they state, the diagnosis of single non-overlapping personality disorder is possible, rather than multiple overlapping diagnoses. These can be related to the currently used personality disorders, as well as providing new diagnoses, such as non-oral-obsessive-borderline, which result from combinations of the current diagnoses.

An alternative approach for mixed categorical-dimensional models is to widen their perspective to include normality while reserving the extremes on these dimensions for categorical diagnoses. Skinner (1981) describes one approach by Sneath (1975) who used a vector model to arrange diseases in a dimensional space. According to this model, normality is represented by a cluster of points surrounding the centre of the dimensional space. As an individual becomes ill they move away from this centre; the distance or length of the vector determines severity of illness, and the direction indicates the type of disease.

A recently proposed model of personality has several similarities to the vector model. The psychobiological model of temperament and character proposes seven dimensions which in combination make up the structure of personality. Three of these dimensions are said to be temperament based, and in combination can describe different personality structures (Cloninger, 1986, 1987). Scores on each dimension can be located in a three dimensional space giving each individual a point within this space. By adding information about character to these temperament dimensions, it is possible to rate the likelihood or severity of personality pathology (Svrakic, Whitehead, Pryzbeck, & Cloninger, 1992). In this model, severity ratings can be established through character dimensions, while a categorical personality diagnosis can be obtained through the temperament profile. This theory is based on a dimensional model that accounts for categorical diagnoses, has a clear theoretical base and provides possibilities for measurement and testing. For these reasons it will form the basis of discussion in the following chapters, as an example of how we might improve our understanding of the role of personality in the area of psychopathology.

CHAPTER THREE
Cloninger's Unified Biosocial Theory of Personality

1. INTRODUCTION:

In 1986, Cloninger, presented a three dimensional biosocial theory of personality. Given the large number of personality theories that had already used a tri-dimensional structure, this idea in itself was not new. What caught the attention of the scientific community, however, was the depth and breadth of information that Cloninger had gathered in support of the theory. During the course of his research, he had reviewed information spanning several different fields of learning, including "genetics (human, animal, and evolutionary studies), psychology (learning theory, cognitive psychology, psychophysiology, personality theory), and psychiatry (nosology, psychopharmacology, longitudinal research)", in support of what he labelled a "unified biosocial theory of personality" (Cloninger, 1986, p. 210).

Historically, personality theorists have tended to retain a primary focus on either biological determinants of personality, or the role of learning through environmental influences. A major goal of the biosocial theory was to draw together each of these broad perspectives into a unified format so that their roles could be examined in relation to each other, rather than in isolation. Cloninger argued that the consideration of biologic variation alone is insufficient to explain the vast array of individual differences that form what we know as personality. The heritability of personality traits has been

repeatedly estimated to be between 40 and 60% (Loehlin, 1982), indicating that genetics accounts for only half of personality variation. Similarly, the contribution of social learning and other environmental factors is insufficient to be able to view them as sole causal influences.

Cloninger (1987) described personality as "individual differences in the adaptive systems involved in the reception, processing, and storing of information about the environment" (p. 574). According to the theory, these adaptive systems are governed by underlying biologic variation, that is, individual differences in the three proposed genetic dimensions of personality. While genetic factors influence neurobiological substrates and activity, they are in turn affected by the environment, hence modifying the expression of those genetic factors (Roy & Linnoila, 1988). In contrast to other theorists who assume that the observable phenotypic structure of personality corresponds with the genetic variation, Cloninger stressed the need to consider them independently. According to this model, the phenotypic structure of personality is based on genetic variation, environmental influences, and interactions between the two.

2. CLONINGER'S THREE DIMENSIONS OF PERSONALITY:

On the basis of information from family studies, longitudinal development studies, psychometric studies of personality structure, as well as neuropharmacologic and neuroanatomical studies of behavioural conditioning and learning in man and other animals, Cloninger proposed three uncorrelated, heritable and stable dimensions of personality. Each dimension was thought to follow a normal distribution and show little or no evidence of

bimodality or multimodality. These dimensions are novelty seeking, harm avoidance, and reward dependence.

Cloninger hypothesised each of these dimensions to be associated with a specific pattern of behaviour in response to a specific type of environmental stimuli, and suggested that variation on each dimension is correlated with activity in a particular central monoaminergic pathway. In addition, he described prototypic personality characteristics of individuals high or low on each of the three dimensions, examining the relative influence of extremes on each of the three primary dimensions individually. Later, Cloninger broadened his analysis to encompass nine personality types based on combinations of these extremes which will be discussed later in relation to the personality disorders. The focus of this chapter, however, is on the nature of these primary dimensions, which are briefly described before their basis is presented in more detail in the following sections.

2.1 NOVELTY SEEKING:

Novelty seeking (NS), the first of Cloninger's dimensions, is characterised by intense responses to novelty, potential reward or potential relief from monotony or punishment, that lead to exploratory activity or active avoidance and escape (Cloninger, 1987). These novelty seeking traits are said to be related to variation in the brain system involved with incentives or behavioural activation. Cloninger defined a central role for dopaminergic activity in this brain system with low levels of basal firing rates being correlated with high NS. A person who is higher than average on NS is characterised as impulsive, exploratory, fickle, excitable, quick-tempered, extravagant, and disorderly; in contrast to an individual lower than average who is described as reflective, rigid, loyal, stoic, frugal and persistent.

2.2 HARM AVOIDANCE:

The second dimension, harm avoidance (HA), is characterised by a heritable tendency to respond intensely to aversive stimuli such as conditioned signals for punishment, novelty, and frustrative nonreward. Such stimuli lead to behavioural inhibition in the form of passive avoidance and extinction (Cloninger, 1987). Cloninger proposed that the principle monoamine neuromodulator involved in this behavioural inhibition system is serotonin, with high basal serotonergic activity corresponding closely to high HA. Individuals who are higher than average in HA are described as cautious, tense, apprehensive, fearful, inhibited, shy, and easily fatigued. Those who are low on this dimension appear to be confident, relaxed, optimistic, carefree, uninhibited, outgoing, and energetic.

2.3 REWARD DEPENDENCE:

The final dimension, labelled reward dependence (RD), is hypothesised to be a heritable tendency to respond intensely to stimuli that represent reward or relief from punishment (Cloninger, 1987). This may occur to the extent that a resistance to extinction of the rewarded behaviour occurs. It is proposed that this behavioural maintenance system is closely related to noradrenergic activity in the brain, with high basal levels of noradrenaline associated with high RD. Those higher than average on RD are described as persistent, industrious, warmly sympathetic, sentimental, sensitive to social cues and personal succour. Those low on RD, in contrast, appear to be socially detached, emotionally cool, practical, tough minded, emotionally independent, and respond largely to practical rewards rather than social ones.

3. ORIGINS OF THE THREE DIMENSIONS:

3.1 SIMILARITIES WITH OTHER PERSONALITY THEORIES:

Personality theory has been through several distinct historical phases in recent times (Millon, 1984). In the first part of the century, it was dominated by the clinical portrayals of theorists such as Freud, Horney, and Sullivan. To these writers personality was a complex but integrated system that required equally complex explanations. During the 1950's and 1960's, however, a very different perspective on personality emerged to challenge this tradition. Theories like Freud's were seen to be grandiose and speculative and were condemned for their lack of testable constructs. The new generation of personality theorists placed an emphasis on observable and hence falsifiable behavioural representations of personality structure. Psychometric tools such as factor analysis were used to determine the number and nature of personality dimensions. This method too was eventually criticised for its inability to determine causal structures in personality. It seemed that in the reaction against untestable theories, researchers had gone to the other extreme by proposing testable but often meaningless factors.

During his research on personality traits in individuals without psychopathology, Cloninger noted that many theorists had proposed three independent dimensions of personality variation (Cloninger, 1987). Three dimensional models presented a common theme in a literature complicated by hundreds of different personality concepts, theories, labels and types. While the details varied between Cloninger and other personality theorists postulating a three dimensional structure, many of the models bore descriptive similarities to his three dimensions.

For example, in Sheldon's descriptions of personality based on body type (as described in Millon, 1981), it is possible to find similarities to Cloninger's three

dimensions. Sheldon's mesomorph, who is assertive, high on physical energy, and has a need for power when troubled, could easily be characterised as a high novelty seeker. In addition, the endomorph, who easily expresses emotion, has a love of comfort, and depends on social approval would score highly on reward dependence. Faced with other similarities, it appeared to Cloninger that researchers from varying theoretical perspectives had been tapping into the same personality substrates. Cloninger (1987) concluded, "the similarities in the descriptions of human motivation and personality . . . suggest some fundamental validity to inferences drawn from widely different perspectives" (p. 503).

What Cloninger saw as the main difference between his approach and that of his predecessors was his use of 'extrastatistical' information to derive the three dimensions of NS, HA, and RD. By postulating a theoretical framework for his three dimensions which could be tested in several different ways, Cloninger was able to combine the advantages of both these historical trends and minimise their shortcomings. He also argued that such a framework enabled clinicians and researchers to discriminate between various conceptualisations in an attempt to find which is most useful. Untestable theories and those based on purely descriptive organisations of personality structure, in contrast, provided no means by which to do this, hence resulting in the endless alternatives proposed throughout history.

3.2 GENETIC RESEARCH IN PERSONALITY:

Genetic research has provided many useful answers in the study of disease and illness. In regard to human behaviour, however, it is only just beginning to be recognised as a significant contributor, the most obvious example being research on the genetic heritability of aggressiveness (Elliot, 1986). For

personality traits measured by questionnaires, it has been consistently demonstrated that heritability is between 40-60% (Loehlin, 1982). In addition, although approximately 50% of personality variation is environmentally influenced, much of this variation has been found to be the result of non-shared, non-familial factors. This indicates that while personality structure is partly influenced by stable genetic factors, the environmental component of the equation relies almost solely on individual experiences rather than familial environmental factors, making research even more problematic (Plomin & Daniels, 1987). Given these consistent findings in the personality literature, Cloninger proposed genetic influences as a key factor in his theory.

McGuffin and Thapar (1992), in their review of the genetics of personality disorder, highlight three methods by which to investigate the influence of genetics on personality. While each has shortcomings, together they provide evidence of the genetic transmission of personality. The first uses animal models of temperament in order to make hypotheses about the genetic transmission of personality traits in humans. It has long been observed in animals that certain strains can be bred for their temperamental attributes. The relation of these studies to humans, however, is fraught with difficulties. Animal studies are only indirectly related to humans, because the behaviour observed is much simpler and more limited than human behaviour. In addition, many believe that personality consists of more than observable behaviour, making relations between studies of animals and humans difficult to assume.

A second source of information regarding the relation of genetics to personality comes from psychophysiological measures, such as electroencephalographic patterns and galvanic skin response, in which personality variables are thought to be reflected. However, given the relative crudity of such measures and their complex relation to personality, these

measures are often thought to be an oversimplification of complex relations. The third method of investigating genetic influences on personality, and the most common, involves the collection of personality measures in relatives reared together and those reared apart. These data are most useful when they have come from pairs of monozygotic and dizygotic twins. There is an overwhelming consensus in this literature that a genetic component of personality exists. As McGuffin and Thapar (1992) state, however, there is still some controversy as to whether this genetic contribution is modest but significant for all traits, or whether there is a differential heritability of certain aspects of personality.

Cloninger has presented material from neurobiological and family studies in support of the heritability of his three dimensions (Cloninger, 1986, 1987). Much of this material has not been directly tested with his three dimensions, however, and he has relied on approximations of other peoples work to his own, such as Gray and Eysenck. For example, Cloninger (1986) cites a twin study of extroversion by Eaves and Eysenck in which they discovered that both genetic and environmental factors contributed to the variability of this dimension. In this study the subscales of impulsivity and sociability were found to be genetically independent. While the social and environmental antecedents were correlated. Cloninger stated that the impulsivity scale included items related to both NS and HA which would account for the genetic overlap with sociability (low HA). He concluded, "This supports the hypothesis presented here that HA and NS are genetically independent but that negative feedback interaction will lead to a single phenotypic factor because of the reciprocal effects of environmental stimuli" (Cloninger, 1986, p. 178).

3.3 GENOTYPIC VS. PHENOTYPIC VARIATION:

The previous example highlights the importance of separating genotypes (genetic substrates) from phenotypes (genetic framework as modified by environmental influences). Cloninger emphasised that although his personalty dimensions were hypothesised to be genetically independent, they were also seen to influence each other when interacting with the environment. For example, he stated that harm avoidance had a modulating influence on both NS and RD (Cloninger, 1987). An individual high on RD would respond to frustrative nonreward with continued reward-seeking. If that same individual was also high on HA, however, the same stimulus should lead to extinction of the behaviour. In such a case, Cloninger stated, the resulting behaviour is based on the balance of the two influences. Therefore, although genetic variation is independent, the structure of observed behaviour may differ according to environmental influences and the interaction of the three dimensions.

Cloninger (1986) contrasted his theory with others who have proposed genetic substrates of personality, such as Eysenck and Gray, stating that they have "implicitly assumed that the observed phenotypic structure of personality corresponds with the underlying biogenetic variation" (p. 215). As an example of this, he compares his dimensions with that of Eysenck who also had as his goal the integration of biological and environmental influences into a scientifically testable format. According to Cloninger, neuroticism has high HA as its major influence, with lesser positive contributions of NS and RD. Extroversion has high RD as its major determinant with various combinations of NS and HA resulting in different subscale scores. Finally, he states, psychoticism depends mainly on high NS, while the contribution of HA and RD varies.

He attributed these combinations to the possibility that Eysenck's dimensions are measuring phenotypic variation and stated that this can also account for the research evidence which demonstrates that they do not correspond well with underlying genetic variation (Cloninger, 1986). Another example of this phenotypic variation is Zuckerman's trait dimension of sensation seeking, which Zuckerman sees as synonymous with NS (Zuckerman, 1988). Cloninger disputes this claim, however, stating that it has no simple relationship to any of his dimensions, appearing instead to be a synthesis of high NS, low HA, and possibly low RD (Cloninger, 1988b).

Cloninger went on to present neurochemical evidence relating to the mechanisms of these heritable dimensions which he proposed influenced the phenotypic structure of personality. The following sections will describe the research that Cloninger used to hypothesise connections between NS, HA, and RD, and the monoamine pathways of dopamine, serotonin, and noradrenaline.

4. BIOLOGICAL EVIDENCE:

4.1 BEHAVIOURAL ACTIVATION (NS) AND DOPAMINE:

The concept of NS rests on the assumption of a behavioural activation system in the brain which "requires both sensorimotor integration and direction of behaviour toward novel or pleasurable stimuli" (Cloninger, 1987, p. 575). Cloninger postulated that this system is associated with dopaminergic activity so that high levels of NS are indicative of low basal dopaminergic activity. In his summary of the evidence to suggest such a connection, Cloninger described the neural pathways involved. Dopaminergic cell bodies in the ventral tegmentum have ascending projections to the striatum, the nucleus

accumbens, the frontal and limbic cortex. Cloninger stated that the behavioural activation system has its final neural pathway via dopaminergic cells in the midbrain which project to the forebrain.

Cloninger cited several studies which have shown self stimulation at the sites of dopaminergic neurons in animals to be accompanied by increased activity and positive reinforcement of the eliciting behaviour. In humans such stimulation has lead to feelings of subjective pleasure and satisfaction. Dopamine depleting lesions in the nucleus accumbens and the ventral tegmentum of animals have resulted in neglect of novel stimuli and a reduction in spontaneous activity and investigative behaviour, while partial lesions have been shown to lead to hyperactivity.

Further support for the role of dopamine in behavioural activation, Cloninger stated, is provided by studies of agonists such as amphetamines, cocaine, alcohol and opiates which facilitate dopamine transmission. Such agonists lead to behavioural activation, whereas dopamine antagonists such as haloperidol result in anhedonia, reduced exploratory behaviour, and a reduced response to positive reinforcement. In his 1986 article, Cloninger described how individuals with impulsivity and somatic anxiety, when treated with dopamine agonists improve, but when treated with benzodiazepines, barbiturates or alcohol show no change and in some cases deterioration.

In his summary of the research on neurochemical influences on behaviour, Mulder, (in press) stated that low dopamine activity has been associated with suicidal behaviour, undersocialised conduct disorder, impulsive and antisocial behaviour. He concluded that dopamine clearly has an activating and incentive function in animals, and that it is possible that low levels in humans will also increase behavioural activation.

This evidence has two noticeable limitations for Cloninger's theory, however. First, although it appears clear that dopamine is in some way involved in behavioural activation, it is not clear in what direction this manifests itself. In the examples cited above, dopamine agonists are said to facilitate the transmission of dopamine and enhance behavioural activation. Yet according to Cloninger, low levels of dopamine are thought to increase behavioural activation. If these studies have been correctly cited it would seem problematic to state that low levels of dopamine activate behaviour. A safer hypothesis would be that while dopamine is centrally involved in the behavioural activation system, the complexity of that involvement is not yet understood.

Second, the studies cited are predominantly concerned with behavioural activation per se, rather than the more specific behaviour of novelty seeking. For example, an animal increasing its locomotor activity and a human experiencing pleasure and satisfaction in response to stimulation of dopamine sites in their brains, do not equate to novelty seeking even though they may be related. In addition, the description of drug effects can be distorted to fit post hoc hypotheses. For example, is a rat injected with haloperidol not able to seek novelty because its locomotor activity is affected, or because its ability to novelty seek is disrupted? The more parsimonious explanation for this is the first.

4.2 BEHAVIOURAL INHIBITION (HA) AND SEROTONIN:

In the same article, Cloninger (1986) postulated that high HA is indicative of activity in the behavioural inhibition system which he believed to be associated with high basal serotonergic activity in the brain. Serotonergic projections are thought to inhibit dopamine neurons, Cloninger stated, and are

essential for conditioned inhibition of activity by signals of punishment and non-reward. The brain areas involved in this system include ascending serotonergic projections from the raphe nuclei to the limbic system and the prefrontal cortex, as well as cholinergic projections from the ventral tegmental area and basal nucleus of Meynert to the frontal neocortex. Cloninger cited Gray who considers the septohippocampal area of the limbic system to be especially important in behavioural inhibition, describing it as a comparator which checks predicted against actual events and interrupts behaviour when the unexpected occurs.

The role of serotonin in suicidal and aggressive behaviour was highlighted in a recent review of serotonin in personality disorder (Coccaro, Astill, & Szeeley, 1990). These authors report that in animal studies it has been demonstrated that decreased serotonergic activity is associated with increased aggression, while in humans it has been associated with violent suicide, past suicide attempts, and impulsive and aggressive behaviour. They report that careful examination of the animal studies show that it is stimulus-linked aggression rather than generalised aggression that is linked to low serotonergic function. In one human study in which all subjects had a history of aggression, however, it was found that low CSF 5-HIAA (5-hydroxy-indoleacetic acid, a metabolite of serotonin) is associated with a history of impulsive rather than planned aggression.

Coccaro et al. (1990) have reviewed the literature that examines the role of serotonin in the treatment of impulsive aggression. They found that while lithium, antidepressants, neuroleptics, carbamazepine and beta-blockers have all been partially successful in reducing aggression in patients, it is still not clear whether this is due to serotonergic influences or other neurochemical systems. Fluoxetine, a specific serotonin reuptake inhibitor, has been shown to decrease aggression in animals, and preliminary data from the treatment of

three patients with personality disorder has found a clear decrease in overt aggressive behaviour. These results led the authors to conclude that "central serotonin function appears to regulate suicidal and impulsive aggressive behaviours in an inverse fashion" (Coccaro et al., 1990, p. 591).

Mulder (in press) also summarised this research stating that low levels of 5-HIAA have been linked with suicide, violent suicide, violent disinhibited behaviour, impulsivity, and arson. In contrast high levels have been associated with low sociability and schizoid personality in young males. Each of these reviews, while remaining aware of the difficulties involved in measuring neurotransmitter functioning, provide preliminary support for the role of serotonin in behavioural inhibition in accordance with Cloninger's theory.

Once again, however, there is a similar problem as there was with dopamine, in that while serotonin appears to be involved with behavioural inhibition, this does not necessarily equate with HA. For example, both dopamine and serotonin have been shown to be linked with suicidal and impulsive behaviour. Cloninger (1986) distinguishes the two sets of data by referring to his clinical experience and what appears to be more parsimonious explanations. But as Eysenck has stated, relying on clinical experience runs the risk of assuming face value to be a scientifically defensible argument, where clearly it is not (Eysenck, 1988).

4.3 BEHAVIOURAL MAINTENANCE (RD) AND NORADRENALINE:

Cloninger (1986) proposed that behavioural maintenance, the final brain system central to his theory, is related to noradrenergic activity, with low basal activity associated with high reward dependence. Noradrenergic pathways

run from the locus ceruleus in the pons to the hypothalamus, limbic structures and the cerebral cortex. While the number of noradrenergic neurons is small they are thought to project throughout the brain.

Cloninger cited learning and conditioning studies which suggest that the effects of noradrenergic deficits are specific, despite their diffuse location. Studies with rats have shown that long term partial reduction of noradrenaline release in the forebrain leads to increased resistance to extinction of previously rewarded behaviour as well as improved response to conditioned signals of relief of punishment. Human studies of short term reduction of noradrenaline release indicate that this selectively impairs paired associate learning, particularly the acquisition of novel associations. Cloninger concluded that these studies suggest that noradrenaline enhances the establishment of conditioned associations in general.

Roy and Linnoila (1988) reported a study carried out measuring MHPG (a metabolite of noradrenaline) in pathological gamblers, which found them to have significantly increased levels of centrally produced CSF MHPG than controls. They concluded that pathological gamblers may have some kind of dysfunction in their reward mechanisms. While this conclusion would concur with Cloninger's hypothesised connection of noradrenaline to behavioural maintenance, they do not comment on the directionality of this noradrenergic influence. According to the theory, it would be expected that pathological gamblers would be high on RD, which is theoretically linked to low basal activity of noradrenaline, a hypothesis that is not supported by this study.

Other researchers are not convinced that noradrenaline relates solely to this behavioural maintenance system, stating that it has been shown to be implicated in a variety of other behaviours (Mulder, in press). It is clear that noradrenaline levels are active in circumstances that lead to increased arousal,

which in turn increases the likelihood of attention and learning. What is not clear, however, is whether this is in response to novel, aversive, rewarding or even all stimuli. Because of this, Cloninger's focus on reward stimuli remains controversial.

4.4 PROBLEMS WITH THIS CONCEPTUALISATION:

With each of the three dimensions there are problems with the hypothesised relations to the three neurotransmitters, such as the directionality of the links and the validity of using general research findings to support Cloninger's more specific labels. In addition, Eysenck (1988) points out that Cloninger has not always been accurate in his interpretation of some of the studies cited. For example, Eysenck states that Cloninger has discussed the work of two separate investigators (Petrie and Buschbaum) without recognising that they use the same terminology in very different ways. This oversight has meant that what is contradictory information has been presented in a supporting context. Given the extensive amount of material cited by Cloninger in his original article it is easy (both as writer and reader) to neglect details of the original experiments used as evidence for the biosocial theory. As Eysenck (1988) points out, however, "a conclusion is only as strong as its weakest support, and his failure here must make one suspicious about other parts of the edifice which may be equally weak and subject to criticism" (p. 74).

Much of the immediate comment and criticism of the theory, however, focused on Cloninger's use of specific neuromodulators in relation to the three dimensions (Mulder, in press; Nurnberger, 1988; Zuckerman, 1988). There was concern that without reference to the many other neurochemicals involved, Cloninger's use of these neurobiologic correlates of behaviour risked oversimplifying their relation to the associated behaviours. While knowledge

of neurotransmitter functioning has increased markedly over the last decade, this area is still extremely complex and clearly requires much more sophisticated models than first believed. Mulder (in press) stated that "it has become clear that the concept of an isolated central nervous system transmitter controlling a specific neurophysiological function is an oversimplification".

At present, progress in this area is hampered by the many methodological and practical difficulties associated with the study of human monoamine systems. These difficulties often relate to problems of measurement, with currently available techniques being either indirect or invasive (Mulder, in press). Once results are obtained, it is unclear whether they have been influenced by unaccounted for variables and as a result become unreliable measures of monoamine levels. For example, difficulties determining the interactions between the neurotransmitters themselves, as well as other variables, create such reliability dilemmas. In addition, there are problems clarifying whether the measurement is a stable reflection of levels or a temporary fluctuation due to state variables. Mulder (1992) also warns that even if a valid and reliable measurement of neurotransmitter activity is obtained, its hypothesised relation to a particular behaviour is in turn influenced by the conceptualisation and measurement of that behaviour.

Although knowledge in this area is advancing rapidly, the available methods of measurement are still relatively primitive. In attempting to create a biosocial model, Cloninger's goal was to integrate this knowledge with other areas of information in the most useful and parsimonious way. As Nurnberger (1988) states, it is unlikely that Cloninger intended to make the assumption that each of his three dimensions equate solely to the chosen neuromodulator, as in his discussion of the biochemical substrates of the behavioural inhibition system Cloninger discusses the role of GABA and dopamine as well as serotonin. By using three relatively well researched

neurotransmitters, however, Cloninger has created a heuristic framework from which to test his theory and develop further hypotheses.

5.THE TRIDIMENSIONAL PERSONALITY QUESTIONNAIRE:

5.1 DEVELOPMENT OF THE TPQ:

Without a practical and reliable way to measure the hypothesised dimensions of NS, HA, and RD, the concepts remained theoretically interesting, but largely descriptive, speculative and difficult to test. Realising this, Cloninger developed a method of quantifying behavioural variation on each dimension so that his hypotheses could be tested. In 1987, he presented empirical tests he had carried out in order to provide such a measurement. He began by developing a clinical interview schedule, the Tridimensional Interview of Personality Style (TIPS) that included quantitative ratings of seven bipolar items for each of the three dimensions. From this, a 100 item self-report questionnaire was developed, which he called the Tridimensional Personality Questionnaire (TPQ)(Cloninger, 1987).

In an attempt to quantify behavioural variation on each dimension separately, Cloninger chose to use clearly independent items to minimise any interaction. In practical terms, he stated, this resulted in the TPQ measuring behaviours thought to be characteristic of individuals extreme on one dimension and average on the other two. Because the TPQ was developed from a theoretical basis (in contrast to earlier studies which relied on factor analysis of self-report behaviour) it was intended to reflect the underlying genetic structure of personality. Variation along the dimensions of NS, HA, and RD was proposed to be normally distributed, with the majority of the population falling within

the intermediate ranges on each dimension.

An 80-item short form of the TPQ was initially administered to a group of 101 medical students, along with various other measures of personality and anxiety. Results of this initial testing showed that the TPQ measures of each dimension had adequate internal consistency and short-term test-retest reliabilities that were moderate to strong. The dimensions were found to be largely uncorrelated and were normally distributed. The weak correlations that existed had been predicted; for example, NS had a weak negative correlation with HA and there was a weak positive correlation between RD and HA. Various tests to evaluate possible response biases showed that these were small and in the predicted directions. For example, high NS was associated with inconsistency of true responses on Tellegen's Multidimensional Personality Questionnaire (MPQ), in accordance with the expectation that individuals high on NS are distractable, inattentive to details, and impulsive.

A revision of the TPQ, consisting of 100 items with four subscales for each dimension, was tested on a United States national area probability sample of 1,019 adults. The subscales of this version of the TPQ are given in table 1. The recently published results provided initial reliability and validity data for the instrument (Cloninger, Przybeck, & Svrakic, 1991). In addition, it was noted in this study that the TPQ scores were only slightly affected by sociodemographic factors and social desirability.

The RD dimension was shown to be less consistent than NS and HA, however, and the authors attributed this to its fewer items, which may have resulted in response characteristics that made it difficult to differentiate clearly among respondents. Cloninger and his associates conceded that before the validity of this dimension can be confirmed, this section of the questionnaire requires

further work. Past theories have also had difficulty establishing the validity of more than two dimensions of personality (Digman, 1990), and Cloninger's problems may reflect the lack of clear knowledge available about additional personality dimensions.

TABLE 1

TPQ SCALES AND SUBSCALES

Novelty Seeking (NS)

- NS1: exploratory excitability vs. stoic rigidity (9 items)
- NS2: impulsiveness vs. reflection (8 items)
- NS3: extravagance vs. reserve (7 items)
- NS4: disorderliness vs regimentation (10 items)

Harm Avoidance (HA)

- HA1: anticipatory worry vs. uninhibited optimism (10 items)
- HA2: fear of uncertainty vs. confidence (7 items)
- HA3: shyness with strangers vs. gregariousness (7 items)
- HA4: fatigability and asthenia vs. vigour (10 items)

Reward Dependence (RD)

- RD1: sentimentality vs insensitiveness (5 items)
- RD2: persistence vs. irresoluteness (9 items)
- RD3: attachment vs. detachment (11 items)
- RD4: dependence vs. independence (5 items)

(Adapted from Cloninger et al., 1991)

Cloninger later compared the results of this American survey with a sample of 274 Yugoslav university students (Svrakic, Przybeck, & Cloninger, 1991). Overall the results suggested that the TPQ was performing in the way it was intended to, and that while the shorter subscales did not have high internal consistency the higher order scales were generally sound. The internal consistency of the three scales matched that of earlier samples with HA the highest, followed by NS, with RD demonstrating the poorest internal consistency. After again finding problems with the RD scale a decision was made to expand the TPQ with the hope that the psychometric properties of the instrument would improve.

5.2 INDEPENDENT STUDIES OF THE TPQ:

To date there have been only a handful of independent investigations of the psychometric properties of the TPQ. These studies also suggest that further refinement of the instrument is necessary before it can be confidently stated to be measuring the theoretical constructs it is intended to measure or that these constructs exist. Nixon and Parsons (1989), using an early version of the TPQ tested a sample of 225 college students and found that the instrument was a valid measure of the theoretical dimensions. They discovered several gender differences with females scoring higher on HA and the social sensitivity subscale of RD. In addition they found a significant difference of college major with engineering students lower than general psychology students on NS and social sensitivity. These authors looked only at intercorrelations and the relation of the dimensions to gender, academic major and intellectual achievement. As a result they did not discover any of the previously mentioned statistical problems with the RD scale.

In a later study, the same investigators tested subjects undergoing treatment

for chemical dependency to determine whether the TPQ could distinguish between different drug user groups (Nixon & Parsons, 1990). While replicating the gender differences found in their earlier study, these investigators stated they were unable to demonstrate that the three scales were independent, or that they discriminated between drug user groups. They concluded that the TPQ must be carefully tested before its use becomes widespread.

Closer examination of their results, however, show that the overall correlations between scales was either significant but low (ie. approximately 0.20), or non significant. While their data for alcoholics did not fit the typologies previously hypothesised by Cloninger (1987), they did demonstrate that the correlation between RD and HA was not significant and that those for NS were around the 0.25 level. HA was shown to be significantly correlated with the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), and NS was significantly negatively correlated with age, results that are both predictable from the theory. For stimulant and other drug abusers the pattern was different, with the only significant correlation between NS and HA, a possibility that Cloninger had originally hypothesised.

While this study provides some contradictory evidence for the biosocial theory, it demonstrates that further research is necessary to refine the measures and to determine whether the TPQ is suitable for discriminating among this population rather than reject the instrument or theory outright. An interesting alternative data analysis in this case would have been to divide the population according to their dimensional profiles on the TPQ and then examine the differences and similarities between groups, rather than look at individual dimensions in isolation.

Another recently published study of 298 university students has highlighted

structural problems with the TPQ (Earleywine, Finn, Peterson, & Pihl, 1992). These investigators examined the factor structure of the instrument using confirmatory factor analysis, as well as examining correlates of the TPQ. While they found the three scales to be correlated with other personality measures, providing evidence for the convergent validity of the instrument, they failed to replicate its three-factor structure. However, although this three-factor structure could not be replicated, no other model examined provided a significant improvement. These authors suggested that the TPQ requires further refinement using techniques such as item analysis, multitrait multimethod assessment and longitudinal data gathering before it can be used confidently to test Cloninger's biosocial theory.

6. CONCLUSION:

The psychometric studies of the TPQ highlight an important issue for the instrument and the theory as a whole; is the instrument measuring the genetic substrates which are theoretically independent, or is it measuring the phenotypic structure of personality? Problems demonstrating the independence of the three TPQ dimensions could indicate that the latter is more appropriate. This then casts doubt on the ability of the TPQ to measure the proposed genetic dimensions psychometrically. Cloninger's claim that his dimensions reflect the genotypic personality structure, as compared to other scales such as Eysenck's and Zuckerman's which he states tend to measure the interactions that form the phenotype, may also be premature.

It is clear from the studies presented that the TPQ has certain limitations as a psychometric instrument. It is, however, still in its early stages, as is

evidenced by the number of revisions it has undergone in the last five years. Much conceptual and empirical work is still needed to ensure that the TPQ is adequately measuring the hypothesised dimensions of NS, HA, and RD in particular. Refinements are inevitable as further testing is carried out. At this stage, however, it provides a useful measure that has acceptable reliability and validity.

With regard to the biological evidence Cloninger presents, there is no doubt that he has oversimplified the complex neurochemical systems involved in the regulation of behaviour and personality. His transgression was not so much to do this, however, but in neglecting to spell out the important role that other neurochemicals have in regulating behaviour. As Nurnberger (1988) states, "it is useful to have the 3 monoamines as 'emblematic' neurotransmitters, but perhaps misleading to allow the reader to form the impression that they are in any sense exclusively implicated in the expression of personality" (p. 76).

It is clear that criticism of the details of Cloninger's supporting evidence is justified, and that the current conceptualisation is likely to undergo much modification and change as measurement techniques become more sophisticated and further testing is carried out. As Cloninger (1988a) himself states, "there are limitations and gaps in each one of these lines of evidence, but together they provide the basis for a coherent model to guide future research" (p. 15). While it is unwise to ignore Eysenck's warning to take care when interpreting specific data to support a particular theory, it would be equally foolish to neglect the potential contribution that this theory has for the study of personality.

Cloninger has provided personality researchers with a scientifically testable base from which to discover more accurate neurochemical and genetic models within an integrated framework. There is no doubt that this model will

change dramatically over the course of time and that the result will be very different from the present conceptualisation. Without such a basis from which to work, however, this process would be slower, more fragmented and similar problems would still exist. It cannot be disregarded that this theory is a careful and thorough attempt to integrate recent neurochemical studies into a biosocial framework. It represents a major advance over past theories which have attempted to do this, both in its attention to large amounts of diverse information, its ease of conceptualisation, and its potential for testing.

CHAPTER FOUR

The Psychobiological Model of Temperament and Character

1. INTRODUCTION:

Since its presentation in 1986, the 'unified biosocial theory of personality' has undergone a significant revision to become the 'psychobiological model of temperament and character.' This relabelling represents two fundamental changes from Cloninger's original theory of personality. While his definition remains essentially unchanged, the conceptualisation of personality has become broader to encompass the two separate but related domains of temperament and character. In addition, there has been an extension of the theoretical base, as is suggested by the use of the word 'psychobiological.' Cloninger and his associates have incorporated several new theoretical perspectives in their extensions to the earlier theory, including humanistic and transpersonal psychology, as well as research from the areas of social and cognitive development.

This chapter reviews these recent developments, which are outlined in two articles due to be published in 1993. The focus of this chapter is the first article, which describes the rationale for the new character dimensions and presents results from preliminary testing of the new model (Cloninger, Svrakic, & Przybeck, 1992). The second article investigates applications of the extended model to the area of personality disorders, and is discussed in the following chapter (Svrakic et al., 1992). After the rationale for extending the

model is presented and the character dimensions are described, the model will be discussed within the wider context of personality development. Because the authors specifically state that the model is one of personality structure and development, several major issues in this area are presented in order to assess the psychobiological model's compatibility with the existing literature.

2. RECENT CHANGES TO CLONINGER'S CONCEPTUALISATION:

The psychobiological model of temperament and character now comprises seven dimensions, and the original personality dimensions of NS, HA, and RD have been relabelled temperament dimensions. Persistence is now considered to be a fourth temperament variable as a result of studies using the TPQ which demonstrated it to be an independently heritable factor from RD (Cloninger et al., 1992). The three new dimensions are considered to be character variables and are distinguished from the temperament dimensions in terms of two distinct memory systems and their influence on learning. Temperament, they state, involves information processing by the perceptual memory system, while that of character is defined as being conceptually based.

The three character dimensions rely heavily on the description of concepts from humanistic psychology, and are labelled self-directedness (SD), cooperativeness (C), and self-transcendence (ST). Cloninger and his associates (1992) state that these factors are related to "the extent to which the individual identifies the self as (1) an autonomous individual, (2) as an integral part of society, and (3) as an integral part of the unity of all things (ie., the universe, which denotes everything turned into one interdependent whole)".

The decision to extend the model to include these character dimensions was based on two main considerations. First, it was an attempt to improve the utility of the model in the area of personality disorder diagnosis (which will be discussed in the following chapter), and second, it was to make the model more comprehensive. The original TPQ research had found certain variables, such as "unpopularity" among 11 year old children, that were not accounted for by the NS, HA, and RD dimensions (Sigvardsson, Bohman, & Cloninger, 1987). Cloninger et al. also cite studies that demonstrate the failure of the TPQ to correlate with established personality factors from other models of personality; such as the agreeability scale of the NEO personality inventory (Costa & McCrae, 1985), and the aggression and alienation scales of the Multidimensional Personality Questionnaire (Tellegen, 1985). In addition, the authors describe variables from the wider personality literature (such as self-acceptance, responsibility, self-esteem, absorption or self-forgetful concentration), of which none appeared to be measured by the TPQ or explained by the original biosocial theory.

2.1 THEORETICAL RATIONALE:

In the original conceptualisation, Cloninger had described neural mechanisms of response to various environmental stimuli such as novelty, danger, and reward (Cloninger, 1986). Individual heritable biases in these responses were considered to be the biological building blocks of personality structure. Cloninger and his associates (1992) now believe that he was mistaken to label NS, HA, and RD as personality dimensions, claiming instead that these three dimensions are better conceptualised as temperament, given their heritability and manifestation in early life. Essentially these dimensions are the genotypes of the original theory.

When distinguishing temperament from character, Cloninger et al. (1992) once again draw on neuroanatomical research, this time discussing the role of memory in the learning processes which, they state, ultimately shape personality. The authors discuss evidence for two distinct types of memory systems in primates, which they then relate to temperament and character. The first is thought to be conceptually driven, involving the explicit processing of words, images or symbols. Retrieval is conscious and humans are able to act on that information intentionally. This type of memory, they state, is an integral component in the development of character traits. The second memory system, in contrast, is perceptually driven, involving unconscious, implicit, and procedural memory. This system, Cloninger and his associates state, is related to the temperament dimensions in the model. The two systems are considered to be neuroanatomically separate, with the conceptual memory processes being carried out in the higher order brain areas of a cortico-limbo-diencephalic system, and the perceptual memory in a lower order cortico-striatal system.

Cloninger and his associates hypothesise that concept-based character traits are defined in terms of insight learning or the reorganisation of self concepts. Because humans convert perceptual input into conceptual memory, stimulus response characteristics depend on the conceptual significance of perceived stimuli. This means that while temperament variables control our automatic responses to activate, inhibit, or maintain behaviour, such responses can be modified and conditioned by changes in the significance of stimuli related to our sense of identity. According to this group of researchers, "from this perspective, personality development is seen as an iterative epigenetic process in which heritable temperament factors initially motivate insight learning of self concepts, which in turn modify the significance and salience of perceived stimuli to which the person responds" (Cloninger et al., 1992)

In further support of their argument, Cloninger and his associates describe ethological research which, they state, indicate a phylogeny of temperament. An ethological hierarchy of the three temperament variables had been presented earlier by Cloninger and Gilligan (1987). Beginning with the behavioural inhibition system (HA) that is present in all animals, the next level in the hierarchy was the activation system (NS) which is present only in more advanced animals. Finally, the maintenance system (RD) appears to be evident only in reptiles and later phyla. In a similar way, Cloninger et al. (1992) now propose that the higher order memory system involved in character development evolved later than the more primitive perceptual memory system on which temperament is based. Despite the separation of persistence in the new model, the authors do not mention where it fits into this ethological hierarchy.

2.2 DESCRIPTION OF THE CHARACTER VARIABLES:

Research into aspects of personality that were uncorrelated with the TPQ, led Cloninger and his associates to believe that they reflected concepts such as the acceptance of the individual self, acceptance of others, and acceptance of nature in general. In a review of these psychological concepts they found that the so-called mature personality (ie. able to adapt effectively, obtaining self-satisfaction) is self-reliant, cooperative and possibly self-transcendent. In contrast, those individuals with personality disorders have problems with self-acceptance, are intolerant of others, and feel self-conscious and unfulfilled. In order to make these hypotheses testable, Cloninger and his team extended the TPQ to provide descriptions of SD, C, and ST.

In each of the following descriptions it is notable that the authors have referred to the character variables in terms of developmental processes. What

these processes are or how they manifest themselves, however, is not directly addressed. There appears to be a certain ambivalence in this description, with their use of the phrase "aspects or stages". The two words are used by the authors interchangeably, but it is clear that they are conceptually quite different. Given the lack of explanation as to what these developmental stages are, the word 'aspects' alone may have provided more clarity until more is known about these stages.

In their description of self-directedness, Cloninger and his associates (1992) cited research on the following concepts; 'will-power' (Watson & Tharp, 1989), responsibility for actions (Leach, 1987), self-esteem and the ability to accept one's limitations (Adler, 1930), locus of control (Rotter, 1966), purposefulness and meaningful goal direction (Frankl, 1984), self-efficacy (Bandura, 1982), and finally the development of automatic responses congruent with individual goals and values (Kasulis, 1987). Based on an amalgam of this research, they propose that SD is "a developmental process with several stages or aspects. These include:

(1) acceptance of responsibility for one's own choices instead of blaming other people and circumstances,

(2) identification of individually valued goals and purposes vs lack of goal direction,

(3) development of skills and confidence in solving problems (resourcefulness vs apathy),

(4) self acceptance vs self-striving, and finally

(5) congruent second-nature vs personal distrust".

The second character variable of cooperativeness is based on observed individual differences in the identification with and acceptance of others. The authors cite the work of Rogers, Erikson, Maslow, Adler and Kohlberg in their description of this concept. They propose that "cooperativeness can be

formulated as a developmental process with several aspects or stages. These include;

(1) social acceptance vs intolerance,

(2) empathy vs social disinterest,

(3) helpfulness vs unhelpfulness,

(4) compassion vs revengefulness, and

(5) purehearted principles vs self-advantage".

Self-transcendence is the third character variable proposed by Cloninger et al. (1992), and is based on phenomena that they state have been neglected by other contemporary personality researchers. ST is derived from diverse areas such as religious research (Princeton Religion Research Center, 1982), research on the lives of mystics and saints (White, 1985), Maslow's concept of self-actualisation (Maslow, 1970), the insight meditation techniques of transpersonal psychology (Wilber, 1985), the concept of unitive consciousness (Underhill, 1911), and transpersonal identification with things outside the self as a result of intense concentration or absorption (Maslow, 1971). This latter phenomenon is linked to the idea of spiritual acceptance which has also been emphasised in the description of self-transcendence.

Cloninger and his associates acknowledge difficulties with the metaphorical nature of this area, citing Shaku (1906) who proposed that these experiences were cognitively intuitive rather than analytical and deductive. Self-transcendence is described as a developmental process with stages or aspects that are relevant to a wide range of populations and cultures. These are;

"(1) self-forgetful vs self-conscious experience,

(2) transpersonal identification (ie., identification with nature)
vs self-differentiation, and

(3) spiritual acceptance vs rational materialism".

This character variable appears to be the least well understood of the seven

dimensions, but the authors state that it deserves further systematic study in order to clarify its significance in the area of personality.

2.3 EMPIRICAL TESTING OF THE MODEL:

From this review of the literature, questions were generated for each of the 13 rationally defined character factors described in the previous section (5 each for SD and C, 3 for ST). These items were pretested on college students and any items having extreme response frequencies or poor intrascale correlations were discarded (Cloninger et al., 1992). This resulted in a 119-item character inventory measuring SD, C, and ST, examples of which are given in table 2. These items were added to the 107 item TPQ (measuring NS, HA, RD and the now separate dimension of persistence), to make up the 226 item Temperament Character Inventory (TCI).

Cloninger and his associates (1992) report the results of testing done with the TCI on 300 adults in the St. Louis area. The sample, which included 150 women and 150 men, was compared with earlier testing of the TPQ with a national probability sample (Cloninger et al., 1991) and was found to be equally as representative. Each of the temperament and character scales showed a high level of internal consistency ranging from .76 to .89, with the exception of the persistence scale which had a Cronbach Alpha of .65. Principle component analysis of the 13 character subscales found that three factors accounted for 59% of the variance. Each character subscale loaded on a separate factor with the exception of 'self-acceptance' which loaded more highly with the C subscales than the SD scales. This, the authors concluded, may indicate that the ability to accept one's own limitations is correlated with the ability to accept them in others.

TABLE 2.

SAMPLE QUESTIONS FROM THE TEMPERAMENT- CHARACTER INVENTORY:

SELF-DIRECTEDNESS:

* My behaviour is strongly guided by certain goals that I have set for myself.
* Many of my habits make it hard for me to accomplish worthwhile goals.

COOPERATIVENESS:

* I like to help find a solution to problems so that everyone comes out ahead.
* It is usually foolish to promote the success of other people.

SELF-TRANSCENDENCE:

* I sometimes feel so connected to nature that everything seems to be part of one living organism.
* Sometimes I have felt my life was being guided by a spiritual force greater than any human being.

(Cited in Cloninger et. al., 1992)

When correlations between all seven scales were carried out, it was found that HA was negatively correlated with SD (-.47), and C was correlated with both RD (.54) and SD (.57). Principle component analysis identified seven clear

factors accounting for 65% of the variance. After rotation it was found that each subscale had highest loadings on the predicted factor, with the exception of RD. The only postulated RD factor that loaded highly was 'attachment vs detachment'; with 'sentimentality vs insensitiveness' and 'dependence vs independence' both loading more highly with the C subscales. Cloninger and his associates comment on problems with the persistence factor which although loading as a distinct seventh dimension also had positive correlations with several SD subscales, and negative correlations with three of the temperament scales. For this reason, the authors conclude, persistence should only tentatively be considered a temperament factor.

The character scales were also examined for effects of gender, ethnicity, and age. There were no gender differences in SD, however women had significantly higher total scores for C and the 'spiritual acceptance' subscale of ST. Ethnicity had virtually no effect, accounting for less than 3% of variance in any scale. Age correlations provided some interesting data, with both SD and C being positively correlated with age. These data will be considered more fully in a later section.

Cloninger and his associates (1992) concluded that these empirical results support a tridimensional model of character structure, with each factor demonstrating an epigenetic development of increasingly inclusive concepts of the self; as an individual, as a part of society and the universe. They state that this also "supports the hypothesis that personality is a complex hierarchical system that can be naturally decomposed into distinct dimensions of temperament and character"(Cloninger et al., 1992).

3. CRITIQUE OF THE NEW MODEL:

Given that this is the first presentation of the character model, it is clear that, like the original theory, it will change as more research is conducted. The theory has now become a model, and it is possible that this indicates a desire to create a more flexible outline than was the case with earlier descriptions of the theory. This section will discuss the model according to the description given above, following which it will be viewed within the broader context of personality development.

The reasons for extending the model to include character dimensions, that is, to make the model more comprehensive and increase its practical utility, are both clear and commendable. The rationale used for doing so, however, is not so readily apparent. The only clear evidence provided by the authors for postulating a difference between temperament and character is that two distinct memory systems exist, one having evolved later than the first. They state that these memory systems and their influence on personality have been neglected in previous models because of the reliance on factor analysis of behaviour rather than underlying causal determinants.

The general relevance of the perceptual and conceptual memory systems to personality processes seems plausible, but the nature of that relation and how it is manifested as temperament and character is not elaborated on. Given that these memory systems have an essential role in the rationale for the character variables, further detail about their involvement would have made their hypotheses stronger.

This is not to suggest that supporting information does not exist. By referring to memory systems and their influence on human behaviour, Cloninger et al. (1992) have alluded to a large body of research in cognitive psychology and neuroanatomical research. They have done so, however, without full

explanation or recognition of that research and its relevance to the psychobiological model. In a similar way, the use of literature from humanistic self psychology seems to merely scratch the surface of the concepts and theories involved. The authors have added even more perspectives to an already broad theoretical base, but it is arguable whether this has given the model more explanatory depth. It appears that in their efforts to be comprehensive, Cloninger and his associates have become overinclusive, sacrificing depth for breadth of information.

The rationale for increasing the number of dimensions from three to seven should also be viewed with some caution. Cloninger's initial rationale for including only three dimensions was stated as, "Empirical factor analyses consistently indicate that there are three major dimensions of normal personality variation in the general population" (Cloninger, 1987, p. 574). In the rationale to extend the model to incorporate seven dimensions, however, it is stated that, "Five factors, plus or minus two, have been suggested to provide a comprehensive model of personality in the general population" and later, "Studies of natural language provide evidence for seven dimensions of personality" (Cloninger et al., 1992). This somewhat arbitrary citing of literature with no adequate explanation seems to avoid the important issue of number and nature of personality dimensions, rather than clarify it.

In addition, the authors make no clear statement that this is indeed the end of their hypothesised dimensions. At one point it is stated that "what is left out of one model can be added until a comprehensive set (of personality dimensions) is accumulated"(Cloninger et al., 1992). This in itself is not problematic given that every theory is subject to modification as new evidence becomes available. What is debatable, however, is the inconsistent use of literature to justify the number of dimensions included in the theory at various points in its development.

Given that there are still problems with the original dimension of RD, from which the new dimension of persistence has arisen, a case may be argued that if these are indeed temperament variables then they should be established and consolidated first. In the recent data examining the factor structure of the TCI, each dimension shows clear loadings on separate factors with the exception of RD. Persistence has a separate factor as Cloninger et al. describe, but two subscales of RD, 'sentimentality' and 'dependence', both load more highly on the C factor, leaving RD to be signified solely by 'attachment'. The dimension of RD has consistently demonstrated problems since the original development of the TPQ. Despite numerous alterations it still has the lowest internal consistency of all the scales with the exception of persistence. Such problems indicate a need for more basic work to be carried out to clarify the nature of the temperament dimensions.

With these points in mind, the psychobiological model is now reviewed with respect to three important issues in the field of personality development, that is, the definition of temperament, the separation of genetic and environmental influences, and the temporal stability of personality in adult life.

4. RELATION TO THE TEMPERAMENT LITERATURE:

Cloninger et al. (1992) are not the first to distinguish between the terms personality, temperament and character. They have often been used interchangeably in the literature, however, and as a result, remained poorly defined for some time (Siefer & Sameroff, 1986). More recently, temperament has come to be generally defined as the nature component of personality, and character the nurture (Vaillant, 1987). While temperament is considered to be

determined largely by biology and genetics, character is thought to be shaped by the social environment and the way in which the individual responds to that environment. The intricacies of individual personality are said to reflect the complex interactions of the two.

By far the most researched and controversial of the two terms is temperament, and it has provoked much debate in the literature since its introduction as a scientifically testable concept in the 1950's (Plomin & Dunn, 1986). Rutter (1987) suggested in a review of this topic that the concept is far more complex than one would first expect. He stated that some writers believe that temperament is reflected only in biologically influenced behavioural styles (eg. Kagan, 1971), while others see it purely in terms of subclinical psychiatric disorder (Stevenson & Graham, 1982). Still others argue that temperament does not exist, instead viewing it as a function of parental percepts (Bates, 1980), or a result of situational influences (Mischel, 1968).

The most usual definitions of temperament, however, focus on manifestation in early life, the influence of genetic factors, and stability over time (Wilson & Matheny, 1986). Although the last of these criteria is no longer considered to be essential, given the maturational changes believed to be associated with personality development (Bates, 1986), the others have also been argued to be neither sufficient nor necessary for the definition of temperament. As Rutter (1987) stated, much of behaviour has a genetic component and heritability of personality characteristics generally rise with age.

Despite such definitional problems, Rutter (1987) stated, there are certain issues that are no longer considered controversial in the field of temperament. For example, there are reasonably reliable measurements of individual differences in children, these differences influence the ways in which other people respond to them, and they are meaningful in terms of their

implications for later development and psychiatric risk. After reviewing the literature he concluded that these 'temperament' characteristics are simple, non-motivational, non-cognitive, stylistic, and represent meaningful ways of distinguishing individuals. While generally appearing in early childhood, he stated, this does not limit their relevance to childhood alone.

At first glance the psychobiological model's definition of temperament appears to fit this summary quite well. NS, HA, RD and persistence, according to Cloninger and his associates, have all been demonstrated to be heritable (Heath, Cloninger, & Martin, 1992). Cloninger has often cited a study using behavioural ratings with children that he states confirms the manifestation of temperament dimensions in early life (Sigvardsson et al., 1987). In addition, the introduction of reliance on a perceptual memory system as a defining factor in temperament appears to fit Rutter's simple, non-cognitive description of temperament. An added advantage is that Cloninger's temperament factors are measurable in adults.

On closer examination, however, this apparent fit with the temperament-character distinction in the literature begins to weaken. Cloninger et al. (1992) state that genetic factors are likely to be just as important as they are in temperament, effectively removing any distinction based on heritability. In addition, the research cited as evidence for the manifestation of NS, HA, and RD in early life, was based on teacher ratings of children's behaviour at ages 11 and 15. These ratings were recorded 17 years before Cloninger himself converted them into scores on the three dimensions, a procedure which creates some doubt as to their validity. Despite this less than perfect methodology no other attempt has been made to rate children let alone infants on these temperamental measures. Finally, Cloninger and his associates make no mention of the literature that has developed concerning temperament, preferring instead to base their distinction on the difference between the

perceptual and conceptual memory systems alone (Cloninger et al., 1992).

5. GENE-ENVIRONMENT INTERACTION:

Most researchers in the field of personality development agree that the highest priority for research is in the area of gene-environment interaction, rather than the individual influence of one or the other (Buss & Plomin, 1986). According to Super and Harkness (1986), processes involved in the links between individual temperament differences and environmental influence are of central importance to developmental theory. They argue, however, that work in this area has remained largely theoretical with few attempts to test hypotheses and methodological difficulties in those that have. Given that Cloninger's theory is grounded in genetics and now postulates a role for the environment, what, if anything, does it have to offer this field?

In the original presentation of the theory, Cloninger emphasised that the phenotypic structure of personality was different from the genotypic structure. Heritable variables were said to interact with the environment to result in the phenotype. However, little was said about the processes involved in this interaction, nor about what it was in the environment with which the temperament variables were interacting. In the new proposal the character variables are said to have developed, in an evolutionary sense, later than the temperament dimensions, and appear to have greater input from the environment in the shaping of personality. The interactions of both temperament and character are now thought to result in the personality phenotype. Cloninger and his associates (1992) describe this interaction as follows; "Our unconscious, automatic responses to initiate, maintain or stop

behaviour are initially determined by temperament factors, but these can be modified and conditioned as a result of changes in the significance and salience of stimuli that are determined by our concept of our identity".

In other words, genetics influence temperament, which is influenced by character, which is in turn influenced by the environment. However, there is still no clear indication as to what the environmental influences are that shape character and how they make up the phenotype. The only proposal in the new model is that it is the individual's perception of the environment that is important, rather than the environment per se. This is indicated by a minor change to Cloninger's initial definition of personality, with the word 'environment' being replaced by 'experience', so that it now reads; "individual differences in the adaptive systems involved in the reception, processing, and storing of information about experience define personality in general" (Cloninger et al., 1992). Other than this, however, direct explanations of the interactions of genes and environment, along with any reference to the relevant literature, remain conspicuously absent from the extensions to the model.

In his reliance on genetic and neuroanatomical causal data, Cloninger and his associates have neglected an important body of literature which investigates the influence of both specific and general environmental factors on personality development (see Rutter, 1984 for a review). This literature is highly relevant to the thesis presented by Cloninger et al. (1992). One example is their statement that environmental effects associated with particular families and cultures should be more important in character development than in temperament. Although still controversial, the concept of non-shared environment has forced a reappraisal of this general hypothesis. It has been found that despite careful research, shared environment has a negligible contribution to personality development, implying that it is non-shared

individually relevant experiences that are important (see for example, the March 1987 issue of *Behavioral and Brain Sciences* for a multi disciplinary discussion of this debate).

Despite the assertion by Cloninger and his associates (1992) that "personality is a complex hierarchical system that can be naturally decomposed into distinct dimensions of temperament and character", this distinction is far from clear as was previously discussed. The problems with the RD subscales may be an indication of this. For example, if several of the RD subscales load highly with the C subscales, it may be that they are measuring phenotypic variation rather than genotypic variation. Given this situation and similar problems with other personality scales, it is conceivable that the full separation of adult personality scales into genetics and environment may not be possible.

Measuring genetic and temperamental influences on personality in adults is fraught with difficulties. It is unlikely that temperament is unchanged by interactions with the environment, and this view is reflected in the vague terminology of temperament definitions, which use qualifiers such as 'largely' inheritable, and genetically 'based'. The question then becomes *when* do environmental effects begin to interact with heritable tendencies and shape personality, and in what way?

6. LIFESPAN PERSONALITY DEVELOPMENT:

Personality stability has historically been viewed from two perspectives, that of cross-situational generality and temporal stability. The first of these has provoked one of the most controversial and indeed crucial debates in the history of personality theory and research (Millon, 1984). For several decades

the question of personality stability across situations was roundly challenged. Recently, however, this debate appears to be resolving with the consensus being that inappropriate methodologies were largely responsible for the lack of data showing cross-situational generality (see Epstein & O'Brien, 1985, for a review).

The issue of temporal stability has received less attention, however, although longitudinal studies have generally indicated considerable consistency of personality characteristics over time (Block, 1971; Conley, 1985). Unlike temperament, which is usually studied in infants and young children, the stability of personality is generally measured in later life. There is an implicit assumption that although changes may occur in childhood and adolescence, once an individual reaches adulthood, personality development is likely to remain fairly stable.

Links between these two periods of personality development are rarely made explicit with researchers tending to focus on temperament as manifested in early life, or personality in adulthood rather than the connections between them. Perhaps due to the lack of previous work in this area, Cloninger and his associates (1992) have also neglected this aspect of personality development. While they state that the character variables reflect developmental processes, they do not make explicit what these processes involve or how they relate to the temperament variables. Despite this lack of clarity, however, Cloninger et al. (1992) do present some interesting data demonstrating significant differences in their character variables across age cohorts. While the authors caution that these findings are only tentative due to their cross-sectional nature, they also note that they warrant further longitudinal testing to clarify their importance.

Earlier testing with the temperament dimensions had showed NS to be

negatively correlated with age for both males and females, while RD was negatively correlated with age in women alone (Cloninger et al., 1991). These latest data show that both SD and C were significantly correlated with age, while ST was not (Cloninger et al., 1992). Self-directedness subscales demonstrated an increasing trend which levelled off at about age 40, with the exception of 'self congruence' which continued to climb. The C subscales showed a sharp increase between the ages of 20-30 and continued to increase steadily with the exception of 'principles' which after a decrease in the 25 to 35 year range increased once more. Although the age correlations with ST were not significant, there were some interesting trends, with 'self-forgetfulness' and 'transpersonal identification' decreasing to the age of 35 and then levelling off, while 'spiritual acceptance' increased to age 40 then declined.

These results have some interesting implications for personality stability during adulthood, implications which are contrary to the majority of studies in recent years which have found the weight of evidence supporting general stability (Costa & McRae, 1986). Cloninger and his associates' data on character variables across the life span warrant the hypothesis that variables such as these do indeed show some predictable changes throughout life. Of course, any such hypothesising must be tentative until longitudinal data can be gathered, however, there is a possibility that 'personality' is not as fixed or permanent as the data to this point have suggested. In addition, these data also give support to Cloninger's assertion that these variables are tapping into dimensions that other personality theorists have neglected.

Costa and McCrae (1986) conclude their review of the implications of personality stability for clinical psychology by emphasising that clinicians need to revise their expectations for personality change in their clients, stating that, "human nature is by no means easily changed" (p. 420). This conclusion is understandable given the therapeutic nihilism that has surrounded

personality disorders and the literature on the stability of normal personality traits. If cooperativeness and self-directedness are found to increase reliably across the age span, however, such a view may be premature. Studying these processes in more detail may provide a better understanding of personality development and possibilities for treatment of personality difficulties.

7. CONCLUSIONS:

As Rutter (1987) concludes in his review of personality development, "No single mechanism is responsible and no one theory provides an explanation. Equally, however, the solution does not lie in any amalgam of all views. There are immense difficulties in any search for an overall explanation for the developmental process, but each of the links in the chain is susceptible to empirical analysis. Therein lies the possibility of understanding what is involved in personality development" (p. 325).

The psychobiological model has the appearance of a comprehensive theoretical framework for personality development. The authors have incorporated several very different points of view into one theory, ranging from behavioural principles of learning to spiritual aspects of humanistic psychology. In this latest presentation of the character variables, however, the citation of literature has sometimes been selective and almost simplistic. Cloninger and his associates appear to have neglected research that is very relevant to their proposal, while at the same time citing vast quantities of literature with little clarification of their underlying principles and how that relates to the model proposed.

Leaving aside these omissions, Cloninger's concepts may still falter in the area

of personality development, coming as they do from an adult perspective. The question must be raised that although the TPQ dimensions are measurable in adults, can they be directly measured in children or even be meaningful? If they are, at what age does it become appropriate to measure them? For example, is it possible to measure NS, HA, RD, and persistence in infants? This would seem a difficult task with the dimensions framed as they are, for adults. If these dimensions are unidentifiable in infants, this would indicate that Cloninger's conceptualisation of them as temperament does not fit with the current emphasis on childhood. Finally, would it have been more appropriate for Cloninger to label the three original dimensions more simply as tendencies toward behavioural activation, inhibition and maintenance? This would have provided better opportunity for measurement at an earlier age and would have reduced the confounding effects of environmental interactions when measuring temperament.

Partly as a result of these difficulties, the theoretical distinction between temperament and character in the model requires further clarification. The authors' use of the terms temperament and character, while generally consistent with the wider literature does not provide an adequate explanation of connections with this literature or even citation of it. Their rationale for using the terms appears to be based more on the face validity of the conceptual and perceptual memory systems, rather than a full consideration of the issues and controversies involved. As a result it is unclear what their use of the term character adds to our understanding of personality structure and development. These details must be carefully examined and clarified before the importance of the psychobiological model's character variables can be fully accepted.

Should these details be clarified, it is clear that the temperament and character scales of the TCI provide the means to test some interesting concepts raised by

the psychobiological model and apparent in the wider literature. As Cloninger et al. (1992) state, the dimensional structure of their personality model enables "the testing of quantitative, falsifiable hypotheses relating psychological variation to its biological and social causes".

One area in which the TCI measures have research applications is in the investigation of the concept of shared environment. According to the psychobiological model, character variables are determined by the individual's response to the environment. This makes it possible to investigate patterns of response to environmental stimuli, given a particular character style as measured by the TCI. For example, if character is likely to determine responses to the environment, an individual high in ST is likely to respond differently to a life threatening illness than someone who is low on this variable. In addition, it would be possible to measure character changes following such an event to determine the effect of the environment on character.

In conclusion, it appears that the area of personality development provides the psychobiological model of temperament and character with many challenges. Rather than provide an 'amalgam of all views', however, the model's greatest potential contribution is in its capacity for the generation of new hypotheses and the empirical analysis of those hypotheses. It is likely that as data are gathered not only will 'links in the chain' of personality development be better understood, but the theoretical clarity of the model will undoubtedly improve also.

CHAPTER FIVE

Personality Disorders and the Psychobiological Model

1. OVERVIEW:

When Cloninger first proposed the biosocial theory of personality it was in the areas of anxiety and alcohol abuse that much of his research was focused. He was quick to recognise, however, the possible applications of his theory to the problematic area of personality disorders. In 1987, Cloninger published his first article devoted solely to the "clinical description and classification of personality variants"(p. 573). In this article, he described the problems currently facing the area as being the frequency with which multiple personality diagnoses are given to individuals, the arbitrary nature of the distinction between maladaptive personality traits and personality disorders, the problems distinguishing personality from the influence of situational variables, and the difficulties associated with social desirability when questioning about criterion behaviours. He also defined several conceptual problems, most notably the choice of categorical descriptions of personality variation over dimensional systems, and the lack of extra-statistical information to provide an anchor for such personality descriptions. Cloninger's biosocial theory of personality was presented as a way to address these fundamental problems.

This chapter will focus on the clinical and theoretical implications of both the temperament and character dimensions for the personality disorders. Results

from research using the TPQ and the TCI will be discussed, first reviewing the early hypotheses relating to the personality disorders, and then the role of the character variables in improving the temperament-character model's relevance to personality disorders. The TCI will then be compared to the five-factor model of personality before concluding with a discussion of the model's relevance to the personality disorders.

2. TEMPERAMENT DIMENSIONS AND PERSONALITY DISORDER:

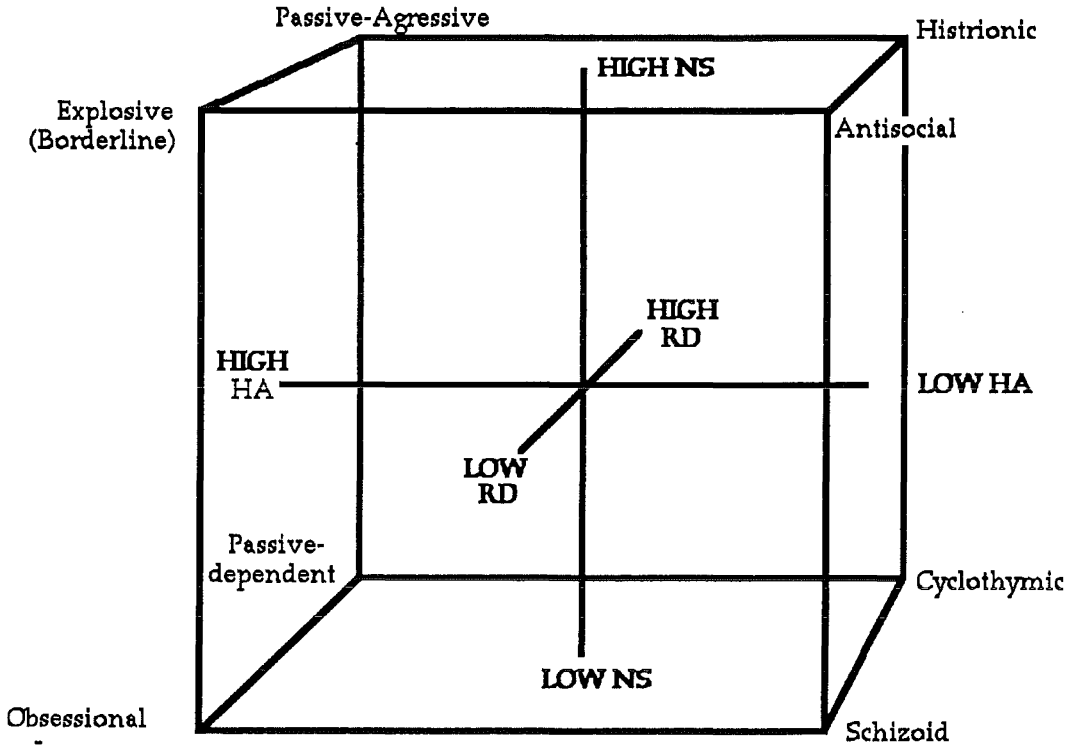
2.1 THE THREE TIERED MODEL OF PERSONALITY VARIATION:

The TPQ dimensions of NS, HA, and RD, were originally hypothesised to be able to subtype people according to a personality profile that was indicative of individual personality disorders. Using these dimensions, Cloninger proposed a three-tier model of personality variation. The first tier considered each of the main dimensions individually, for example, high vs low NS. The second order clusters described six combinations of extremes on two of the three dimensions, for example, variations in NS and HA being related to impulsive-aggressive vs rigid-patient personality traits. The third order clusters of personality traits, however, were those Cloninger proposed to be related to clinical descriptions of personality disorders.

These eight clusters were derived from combinations of the two previous groups, so that individual profiles of personality variation could be established, for example, high NS, low HA, and low RD being indicative of antisocial personality disorder. Cloninger labelled these eight personality disorders, antisocial, histrionic, passive-aggressive, explosive, obsessional,

schizoid, cyclothymic, and passive-dependent. The relations of these disorders to the three dimensions of NS, HA, and RD can be summarised in the form of a cube (figure 1). For example, personality disordered individuals of a histrionic type should have personality profiles that demonstrate extremes on each of the three dimensions represented by the perpendicular axes; that is, high on NS, low on HA, and high on RD, so that such individuals occupy the top right back quadrant of the cube.

Figure 1 **Relation of Novelty Seeking, Harm Avoidance and Reward Dependence to the Proposed Personality Disorder Diagnoses.** (Adapted from Cloninger, 1986).



2.2 RELATION TO TRADITIONAL PERSONALITY DISORDERS:

For each of the eight extreme combinations, Cloninger (1987) gave a brief description and discussed their relation to traditional descriptions of personality disorders. While some corresponded quite closely to the DSM-III descriptions, such as dependent personality disorder, others were more restricted, defining narrower groups than DSM-III allowed for. Schizoid personality disorder as described in the DSM-III, according to Cloninger, required indicators of low RD only. This, he stated had resulted in a highly heterogeneous group which can be subtyped using further information about NS and HA. Cloninger also used some labels not present in the DSM-III. For example, he used the term cyclothymic to describe individuals low on NS, low on HA and high in RD. By using these personality dimensions, he stated, a distinction between cyclothymic personality and depressive disorders can be made, with personality disordered individuals having personality traits that are not necessarily linked to mood disturbance, such as frugality (low NS) and persistence (high RD).

There were several personality disorders featured in the DSM-III that were not accounted for by Cloninger's model; that is, the narcissistic, avoidant, borderline, schizotypal, and paranoid. Cloninger explained that some of these can be included under other labels as they represent second order combinations (narcissistic resulting from high NS and high HA; avoidant a result of high RD and HA). Cloninger originally claimed that borderline personality disorder was a variant of histrionic personality. However, he now believes it to be distinct, identified by high NS, high HA and low RD (Cloninger, 1992, conference address); that is, what he had originally labelled explosive personality. Schizotypal and paranoid personality disorders, however, he proposed to be more appropriately described as axis I disorders given their distorted or defective information processing, regardless of the

situation.

At the time these labels gave the theory an intuitive face validity that aroused the interest of clinicians working with personality disordered patients. In hindsight, however, it may have been premature to use such labels before testing the hypothesised dimension against the traditional labels and concepts to examine their similarities and differences. That is, by testing a large number of psychiatric patients and matching their diagnoses to TPQ profiles, it would have become clearer which labels were misleading, which required further refinement and so on.

Once testing began it became clear that at least some of Cloninger's labels were superfluous, the explosive personality for example. In addition, Cloninger and his associates have since conceded that the original theory's inability to account for personality types such as the paranoid and schizotypal was a flaw in its design (Cloninger et al., 1992). Although presented as theoretical hypotheses, the three tier system and its corresponding labels proposed a level of complexity that was grounded in little more than clinical intuition and speculation. While the theory itself was well grounded in biogenetic evidence, Cloninger's means of labelling the personality extremes appeared to perpetuate the semantic problems of the personality disorder literature.

2.3 AN INTERMEDIATE ADAPTIVE OPTIMUM:

In this original presentation, Cloninger postulated that all personality dimensions have the same underlying biogenetic structure, implying that maladaptive traits represent extreme variants of normal traits. To elucidate this distinction further, Cloninger proposed the concept of an intermediate

adaptive optimum, whereby individuals with intermediate values are able to adapt to a wide variety of situations. Individuals with extreme values on particular dimensions, however, find these traits to be advantageous or disadvantageous depending on the situation in which they are manifest. Cloninger provided as an example the individual high in NS and low in HA, who would be an excellent explorer but an unhappy accountant. Those with extreme scores, while able to function in special situations, are disadvantaged by their inability to do so in a more general sense.

The concept of an intermediate adaptive optimum highlighted the advantages of viewing personality in terms of a dimensional continuum as discussed earlier in this thesis. Viewed in terms of dimensions, adaptability is not an all or nothing entity, but occurs by degree and depends on situational influences. With adaptability spread over three dimensions it can account for personality problems that are not severe enough to warrant a diagnosis. For example, an individual high on RD but with average values on HA and NS may have difficulty coping with rejection from a close friend, but may be able to adapt well to a novel experience that is potentially dangerous.

2.4 DIMENSIONAL ADVANTAGES:

The biosocial theory provides a clear illustration of the advantages of a dimensional classification system for the personality disorders. Earlier, it was noted that although dimensional classification is desirable for this area, no acceptable method of doing so had been found. Cloninger (1987) proposed that by using the TPQ it was possible to simplify, systematise and quantify the description and diagnosis of personality deviations according to heritable stimulus response characteristics, while at the same time providing a means to incorporate traditional categorical diagnoses of personality disorders into a

dimensional system. Information about adaptive and maladaptive traits, he stated, is potentially useful in treatment settings, regardless of the theoretical approach taken. Finally, he hypothesised that because of these improvements and changed emphasis from disorder to dimensions, the pejorative connotations of personality diagnoses would be reduced.

At that point, however, the theory had not been tested in relation to the personality disorders. In the process of conducting research on the TPQ, Cloninger and his associates noted that not all individuals with extreme scores on the three dimensions were personality disordered, according to traditional methods of diagnosis. Accordingly they hypothesised that additional variables other than NS, HA, and RD needed to be involved in the development of personality disorder for this to occur. Along with the considerations discussed in the previous chapter, this provided the motivation to expand and improve the biosocial theory and ultimately led to the development of the character dimensions of SD, C, and ST as previously described.

3. CHARACTER DIMENSIONS AND PERSONALITY DISORDER:

3.1 OVERVIEW OF THE STUDY:

During the development of the character variables it was proposed that character factors common to all personality disordered individuals could be used to determine their presence or absence, regardless of other aspects of personality and psychopathology. This was tested in a recent study (Svrakic et al., 1992) along with the earlier hypothesis that the temperament dimensions

could separate the disorders into subtypes. During the course of the study, 136 subjects were assessed using the Structured Interview for DSM-III-R Personality Disorders-Revised (SIDP-R) (Pfohl, Blum, Zimmerman, & Stangl, 1989), in addition to self-report measures, including the TCI, the NEO-PI (Costa & McCrae, 1985), and the Inventory of Depressive Symptomatology-self-rated version (IDS-S) as a measure of mood (Rush, Giles, Schlesser, Fulton, Weissenberger, & Burns, 1986).

The range and frequency of personality disorder diagnoses in this sample were found to be comparable to those previously reported (Stangl, Pfohl, Zimmerman, Bowers, & Corenthal, 1985; Trull, 1992). Of the 136 patients, 49% had at least one personality diagnosis. Multiple diagnoses were frequent ranging from one to seven per case, with the average being 2.1. A further 17 patients (12%) were labelled 'mixed', as they had all but one of the required criteria for each of two personality disorders.

The majority of diagnoses fell into Clusters B (impulsive or erratic) and C (fearful or anxious) of the DSM-III-R categorisation, with only 8% having a Cluster A diagnosis (aloof or eccentric). Histrionic, avoidant, and obsessive-compulsive personality disorders were the most frequently diagnosed, while schizoid occurred in only one case, and no patients met the full set of criteria for schizotypal or sadistic personality disorders. Of the 134 patients with an axis I diagnosis, 81% had a mood disorder. Of all axis I diagnoses, only dysthymia was significantly more frequent in those with personality disorder than without.

There are several important characteristics of this sample which although mentioned by Svrakic and his associates, are not examined in terms of their effect on the results. For example, the small number of Cluster A diagnoses make extrapolation from this group more difficult. In contrast, the large

number of mood disordered patients may have affected the results, making the sample unrepresentative in relation to general psychiatric populations. In addition, several diagnostic categories have few or no subjects, necessitating analyses of symptom counts rather than diagnoses. This procedure has several important implications which are not emphasised by these researchers.

Using the results from the SIDP-R dimensionally necessitates a different conceptualisation of personality disorder from the more traditional method of obtaining categorical diagnoses from it. This distinction is important to clarify, as results demonstrating a relation between high numbers of antisocial symptoms and low scores on HA, for example, does not necessarily establish that the diagnosis is associated with that dimension. This is most important with the infrequently diagnosed disorders such as schizotypal, where in this study, the symptom counts originate from subjects who do not have that disorder. In addition, problems such as overlapping criteria and the fact that some disorders have fewer criteria than others may create artifactual correlations. Bearing these points in mind, the following sections describe the results of this study.

3.2 TCI VARIATION AMONG PATIENTS:

Once again the TCI scores were examined for variability and internal consistency. While NS, HA, SD, C, and ST all had Cronbach Alphas ranging from .80 to .90, RD again demonstrated less consistency with .75, and the persistence scale obtained .48, indicating that there are still problems with these two scales. Given the ongoing difficulties with these two scales, it may have been useful to investigate them thoroughly to establish their validity before focusing attention on the character dimensions. The danger now is that these scales will be neglected as research efforts are concentrated on the

character dimensions.

When patients with and without personality disorder were compared to the community sample described in the previous chapter several significant differences were found. Personality disordered individuals had higher scores on HA and lower scores on SD than all others. Non-personality disordered subjects differed from the general population sample on the C and RD scales, having higher scores on these dimensions. Finally, the general population sample had significantly higher scores on the ST dimension than both personality disordered and non-personality disordered patient groups.

Scores on the TCI were then tested for correlations with symptom counts from the SIDP-R interview, to ascertain the effectiveness of the self-report instrument to predict tendencies toward clinical interview diagnoses. One of the most consistent results of the study showed that low scores on both the SD and C scales were correlated with high symptom counts for all DSM-III-R clusters of personality disorders. In addition each cluster was associated with a particular temperament variable so that Cluster A symptoms were correlated with low RD, Cluster B with high NS, and Cluster C with high HA.

3.3 PREDICTION OF PERSONALITY DISORDER USING TCI CHARACTER SCALES:

When personality disorder symptom clusters were considered individually, SD and C were found to be negatively correlated with them all. Only 3 of 28 correlations failed to reach significance (SD and schizoid; C and avoidant; C and dependent personality disorder). The only significant correlation for the ST dimension, however, was a negative correlation with schizoid symptoms. To analyse this further, Svrakic and associates carried out a stepwise logistic

regression in order to determine the usefulness of TCI scores in predicting the presence or absence of any personality disorder. SD was found to be a highly significant predictor (partial R = .54, $p<.0001$), with C also being an important contributor (partial R = .30, $p<.05$). None of the other five factors were significant.

The overall rank correlation between the logistic function and the presence or absence of personality disorder was also highly significant. Examination of the relation of personality disorder and SD alone demonstrated that the observed percentages were remarkably similar to those predicted by the logistic function. These results are summarised in table 3. SD scores were also shown to predict the number of personality disorder diagnoses with those scoring higher than 30 having an average of 0.6 diagnoses as compared to those scoring less than 20 who had an average of 2.3 diagnoses. Svrakic and his associates do not report whether these differences are significant.

TABLE 3.

PREDICTED AND OBSERVED PERSONALITY DISORDER IN RELATION TO SELF-DIRECTEDNESS SCORES ON THE TCI.

SD Score	Predicted Percent PD	Observed PD
Higher than 30	13 - 33 %	25 % (13/51)
20 - 30	44 - 66 %	43 % (22/51)
Less than 20	70 - 85 %	91 % (31/34)

It was also found that using C scores helped further delineate the risk of personality disorder. For those who scored higher than 20 on SD, higher C

scores appeared to reduce the risk of personality disorder. For those patients who scored less than 20 on SD, however, there was a high risk of personality disorder regardless of their C score.

3.4 RELATION OF TEMPERAMENT TO PERSONALITY DISORDER SYMPTOMS:

This study by Svrakic and his associates was the first attempt to test the relation of the temperament scales to personality disorder symptoms measured by a structured interview. From the results it is possible to match Cloninger's early predictions about the relation of the temperament variables of NS, HA, and RD, to personality disorder subtypes. This matching is summarised in table 4 where the predicted profiles of personality disorders from the TPQ are compared to significant correlations of NS, HA, and RD dimensions with personality disorder symptoms gathered from clinical interview with the SIDP-R. For example, Cloninger's original prediction for antisocial personality disorder was high NS, low HA and RD. This most recent study demonstrates that antisocial personality disorder is in fact correlated with high NS and low RD, but not significantly with low HA.

In this recent manuscript, Svrakic et al. have presented this information in a three dimensional model similar to that in figure 1 (Svrakic et al., 1992). The model illustrates correlations of the personality disorders with the temperament dimensions and is presented slightly differently from that in table 4, in that personality disorders are positioned according to all levels of correlation regardless of significance. In this way it is possible to determine each individual personality disorder's profile in relation to the others. For example, although histrionic personality disorder did not significantly correlate with reward dependence, histrionic symptoms demonstrate one of

TABLE 4.

COMPARISON OF PREDICTED PERSONALITY DISORDER PROFILE USING TEMPERAMENT DIMENSIONS AND CORRELATIONS WITH PERSONALITY DISORDER SYMPTOMS FROM THE SIDP-R.

TPQ Label	Predicted Profile *	Significant Correlations **	DSM-III-R Label
Antisocial	NS ha rd	NS --- rd	Antisocial
Histrionic	NS ha RD	NS --- ---	Histrionic
Explosive	NS HA rd	NS HA ---	Borderline
Passive-aggress	NS HA RD	NS --- ---	Passive-aggress
Cyclothymic	ns ha RD	--- --- ---	---
Schizoid	ns ha rd	--- --- rd	Schizoid
Passive-depdt	ns HA RD	--- HA RD	Dependent
Obsessional	ns HA rd	--- HA ---	Obsessive-comp.
---	---	--- --- ---	Narcissistic
---	---	ns HA ---	Avoidant
---	---	--- HA rd	Schizotypal
---	---	NS --- rd	Paranoid
---	---	NS --- rd	Sadistic
---	---	--- HA ---	Self-defeating

* Predicted high scores upper case (eg. HA), predicted low scores lower case (eg. ns).

** Positive correlations upper case (eg. NS), negative correlations lower case (eg. rd).

the highest positive correlations with RD, in relation to the other personality symptoms.

It is important to note that there is no consistent method of determining what is actually high and low on these dimensions. Most studies have imposed one cut-off point, below which is classed as low, above which is high, as opposed to having an average band of subjects between these classes. There are several methods of determining this cut-off point and it appears to have been left to the discretion of the researcher which they choose. For example, it is possible to use the research population sample means, normative data means, or simply to take the mid-point of the scales themselves. In addition, as Svrakic and his associates have done, results can be considered in relation to different subcategories of the same group. Each method has the potential to provide a different set of results, therefore it is important to ascertain which is being used.

4. COMPARISON WITH THE FIVE-FACTOR MODEL:

4.1 HISTORICAL CONTEXT:

Svrakic et al. (1992) also compared the diagnostic power of the TCI with that of the Neuroticism-Extraversion-Openness Personality Inventory (NEO-PI, Costa and McCrae, 1985). The NEO-PI is a popular factor-analytically derived instrument based on the five-factor model of personality. Before considering the results of this comparison, however, it is helpful to consider the five-factor model in its historical and current context.

The five-factor model has its origins in the lexical tradition, which sought to

systematise the language of personality. In the early 1960's, researchers began to demonstrate five consistent factors of personality, regardless of sample composition or the instrument used. The model lay dormant in the 1960's and early 70's, however, due to the sustained attack on personality research in general, only to emerge again in the 1980's when researchers began to reconsider the feasibility of five basic factors of personality (Digman, 1990).

Recently, the five-factor model has had a great deal of attention in the psychological literature (Ben-Porath & Waller, 1992; Costa & McCrae, 1992; Digman, 1990; McAdams, 1992; McCrae & John, 1992). Some authors claim it to be the "grand unifying theory for personality" (Digman, 1990), while others describe it as a "turning point for personality psychology" (McCrae & John, 1992). Those more sceptical about the model, however, believe it to be a useful basis from which to understand certain facets of personality (that is, observer ratings), but as a whole, incomplete in its understanding of the complexity of human personality (McAdams, 1992). Despite the extreme statements it is clear that the five factor model has provided some coherence and clarity in an area that has suffered from inconsistency and lack of focus.

4.2 DESCRIPTION OF THE FIVE FACTORS:

The nature of factor analysis makes the naming of the five factors problematic. As McCrae and John (1992) state, "factor names reflect historical accidents, conceptual positions, and the entrenchment that comes from a published body of literature and from published instruments" (p. 177). However, some consensus has been established and the following labels are the most commonly used;

I Extroversion or Surgency,

II Agreeableness,

III Conscientiousness,

IV Neuroticism or Emotional Stability,

V Culture or Openness to Experience.

It is tempting to speculate where the seven temperament and character variables fit into this kind of model, however, as will be discussed later, such speculation may not be appropriate. What is appropriate, however, is to return to Cloninger's initial rationale for establishing three basic dimensions of personality, and to speculate on the lack of reference to this five factor research as opposed to that proposing three variables. As discussed earlier, there were several gaps in the rationale for the recent expansion of the model to seven dimensions. From the view point of the five-factor model it is obvious that the citation of research concerning the number of dimensions has been selective to fit whichever number is appropriate to the model, whereas a full consideration of this literature may have added to the new conceptualisation.

4.3 APPLICATIONS OF THE MODEL:

To return to the five-factor model, however, it has recently been suggested that the model has applications in a wide variety of research and applied settings; such as clinical psychology, health psychology, temperament studies, social psychology, and interpersonal psychology (Wiggins, 1992). In clinical settings it has been suggested that the NEO-PI is a comprehensive method of measuring both normal and abnormal personality (Costa & McCrae, 1992). This was the topic of a recent debate between the authors of the instrument and a pair of more sceptical clinicians, Ben-Porath and Waller (1992). While Costa and McCrae argued that the NEO-PI provides clinicians with additional personality information useful in diagnosis, choice of treatment and determining prognosis, their opponents were not convinced that it added

anything to traditional methods of personality assessment in clinical psychology such as the MMPI and MMPI-II (Butcher, Graham, Tellegen, & Kaemmer, 1989).

Several authors have compared the NEO-PI with clinical measures (Costa & McRae, 1990; Schroeder, Wormworth, & Livesley, 1992; Wiggins & Pincus, 1989). All conclude that the NEO-PI accounts for a substantial proportion of the variance in personality disorder symptomatology. However, there are several caveats to such a conclusion based on their methodology. Each of these studies was carried out with normal population samples, making their generalisability to clinical populations questionable (Widiger & Trull, 1992). It is important not to underestimate the influence of Axis I and II disorders on personality self-ratings and using personality disorder symptoms from general population sample runs the risk of doing so. The use of any instrument needs to be thoroughly tested on the population it is intended for before widespread implementation.

4.4 COMPARISON WITH THE TCI:

When compared with the TCI in a clinical population, the information provided by the NEO-PI, in terms of risk for personality disorder, was minimal (Svrakic et al., 1992). Using logistic regression it was found that high Openness scores increased the risk of personality disorder only slightly (logistic parameter -.03, Chi-square = 4.7, P= .03). Self-directedness, in contrast, was a major contributor (logistic parameter -.12, Chi-square = 16.3, P= .0001), while C also contributed (logistic parameter +.12, Chi-square = 6.2, P= .01). When the TCI and the NEO-PI were analysed together and age and depression were controlled for, however, only SD was a significant predictor of personality disorder. Multiple regression analysis found that the NEO-PI

explained 40% of the variance in the TCI, but did not adequately explain persistence or self transcendence. Svrakic and his associates (1992) concluded from these analyses that the TCI has greater statistical power and is more comprehensive than the NEO-PI when used with a clinical population.

Some, however, have concluded that the five-factor model (as measured by the NEO-PI) does provide a suitable dimensional model for the DSM-III-R personality disorders (Widiger & Trull, 1992). This statement is generally made with the caveat of further testing with clinical populations and with suggestions to improve its applicability, such as providing a structured clinical interview based on the five factors. Widiger and Trull (1992) believe that the weight of empirical support for the five-factor model places it ahead of viable alternatives such as Cloninger's. Given the so-called atheoretical stance of the recent DSM's, this is an important consideration. What such an opinion neglects, however, is the advantage of having a classificatory system based on causal hypotheses. Such hypotheses are useful not only for the explanations they can currently provide, but also for providing a means to discover more explicit hypotheses in the future.

4.5 ADVANTAGES OF THE TCI:

Based as it is on factor analyses of self-report inventories of personality, the five-factor model provides no explanation of the 'why' of personality structure. Proponents of the model do not deny this deficit, stating that the model is a descriptive taxonomy of observable characteristics of personality, rather than a causal one. In contrast, Cloninger's model, along with those of Eysenck and Gray before him, has gone further in an attempt to define the underlying causal structure of personality. More importantly, it has provided clear directions as to how researchers may undertake further investigation to

support or refute such causal hypotheses.

In accord with this view, Svrakic et al. (1992) state that it is the TCI's content and aetiological homogeneity that is more important than its statistical power and comprehensiveness. Whereas models based on causal hypotheses can be expanded according to new evidence, and instruments statistically improved, a descriptive model can not always provide the best means from which to find causal answers. Svrakic et al. use neuroticism as an example of this, stating that it has been demonstrated to be a nonspecific measure of psychopathology, confounding personality pathology with disorders such as anxiety and depression. In contrast, SD according to this analysis, appears to be a core aspect of personality disorder alone, regardless of other psychopathology. They also claim that at present the model provides a fuller description of behaviours that protect against personality disorder than does the NEO-PI. For example, agreeableness in the NEO-PI is measured by one scale only as opposed to the five subscales of the TCI's cooperativeness dimension.

Svrakic et al. (1992) conclude that the model's reliance on biogenetic information and the separation of temperament and character provide better opportunity to test the causes and development of personality disorders than do factor analytically derived models such as the NEO-PI. In such models, they state, temperament and character are often confounded, imposing limitations on further investigation. By distinguishing character from temperament, for example, Cloninger and his associates were able to ascertain developmental changes in character variables while temperament remained largely the same. It is hoped that the model can provide a similar guide to investigating the development of personality disorders.

It would seem that the major difference between the two models is in their organisation of the dimensions or traits. Cloninger has chosen to take a

"bottom up" approach, with his temperament and character dimensions as a base from which personality is built. The five factor model, in contrast, uses a "top-down" approach with its five factors at the top end of a hierarchy, under which less central personality constructs can be arranged. In this sense each model has something different to offer personality researchers, and for this reason neither should compete with the other. In clinical practice, however, it appears that the information provided by the TCI does have something to offer beyond that of the five-factor model and other clinical instruments. The identification of a core construct of personality disorder that can distinguish personality disordered patients from other psychiatric patients is an important discovery that has several implications for both research and practice. For this reason, if no other, it deserves further research attention.

5. DISCUSSION OF THIS RESEARCH:

5.1 IMPLICATIONS FOR CLINICAL RESEARCH:

The study of the TCI using a clinical population has been the first empirical test of the theory's usefulness in the context of personality disorders and psychopathology. In that sense it is a milestone study for the model as a whole. The results have been impressive, despite problems with and reservations about the theoretical basis of the character dimensions. What then are the implications of these results for the model and its place in the area of personality disorders? Svrakic and his colleagues draw several important conclusions from this study concerning the definition of personality disorder, practical improvements for diagnosis and suggestions for treatment.

5.2 CORE FEATURES OF PERSONALITY DISORDER:

In terms of definition, they state that low SD appears to be a core feature of personality disorder. While SD by itself is the greatest indicator of personality disorder, some patients scoring highly on SD are still diagnosed as personality disordered due to their low C scores. They state that "most individuals with personality disorder have difficulty accepting responsibility, setting meaningful goals, resourcefully meeting challenges, accepting limitations, and disciplining their habits to be congruent with their goals and values. However, sometimes highly self-directed patients are diagnosed as personality disordered because they are excessively self-centered, socially intolerant, unhelpful to others, and lacking in empathy, compassion, or principles" (Svrakic et al., 1992).

These authors propose that with SD and C as core features of personality disorder, the TCI can be used as a screening device for DSM-III-R personality disorders. These two studies demonstrate that 8% of adults in the general population have SD scores of less than 20, and that in clinical samples such scores indicate a 90% probability for personality disorder. In addition, dimensional TCI scores were shown to be able to quantify the number, certainty and severity of personality diagnoses.

5.3 DIAGNOSING PERSONALITY DISORDER SUBTYPES:

Once screened for any personality disorder, Svrakic and associates claim that the TCI temperament variables can then be used to subtype into traditional categories. While Clusters A, B, and C can be defined by low RD, high NS and high HA respectively, each personality category is said to have a unique personality profile. Svrakic and his colleagues propose the TCI to be a useful

diagnostic instrument that is far less time-consuming than traditional methods of assessing personality disorder, such as structured interviews. This conclusion may be premature, however, in that these results need to be replicated, preferably by independent researchers. While the SD and C results are impressive in their prediction of personality disorder, and the matching of personality extremes to disorders is encouraging, the subtyping according to temperament is still far from accurate. For example, these results show antisocial, paranoid and sadistic personality disorders to have the same temperament extremes, rather than the "unique personality profile" suggested by the authors.

Confounding these results further are the continuing psychometric difficulties with the RD and persistence scales, and how these might impact on the use of the TCI is not discussed by the authors. Similarly, at this point persistence and ST appear to add little to the diagnosis of personality disorder, in clear contrast to the other five dimensions. Persistence correlates with only one symptom cluster (passive-aggressive), as does ST (schizoid, which only had one clear case of the disorder). This finding lends little support to Svrakic and his associates' conclusion that the NEO-PI is less comprehensive in a clinical setting than the TCI as it does not account for these two dimensions (Svrakic et al., 1992).

5.4 TREATMENT POSSIBILITIES:

Based on the results from these five dimensions, however, the authors claim that the TCI provides the clinician with a comprehensive and individual personality profile that is potentially useful in both diagnosis and treatment, as opposed to multiple categorical diagnoses that risk the loss of such idiosyncratic information. Svrakic and his associates hypothesise that while

temperament variables may be amenable to psychopharmacological and behavioural interventions, the character dimensions may respond better to cognitive, existential and psychodynamic forms of therapy. By separating personality into temperament and character, they propose, it will become possible to treat the components of personality disorder more appropriately, and that a combination of treatments is likely to be more useful with such patients than a single one in isolation.

CHAPTER SIX

The Psychobiological Model and the Future of Personality Research in Psychopathology

1. OVERVIEW:

Early in this thesis it was argued that personality information in the area of psychopathology, while acknowledged to be important, has suffered from several conceptual and practical problems. Those discussed included a lack of standardised measurement procedures, a focus on the categorical diagnosis of personality disorder, a lack of successful treatment options, and a scarcity of clear theoretical guidelines from which to consider these problems. Difficulties involved in the classification of personality were then elaborated on, with particular reference to the debate over the suitability of a categorical or dimensional system. It was concluded that while the dimensional approach had much to offer the area of personality pathology, few adequately tested models were available to replace the traditional and familiar categorical model.

In subsequent chapters, the work of Cloninger and his colleagues was introduced in order to demonstrate how a dimensional model can begin to address these problems. The biosocial theory of personality and later the psychobiological model of temperament and character, propose a dimensional view of personality that integrates normal and abnormal personality structure, while still allowing for the categorical diagnosis of extreme personality

profiles. Cloninger and his associates have presented evidence for a theoretical base from which to view personality that spanned several different fields of study. In addition, they have designed psychometric measures so that the concepts involved can be empirically verified. Finally, at each stage of the theory's development they have offered suggestions for the treatment of personality disorder.

In this final chapter the model proposed by Cloninger and his associates will be evaluated in terms of its current and future role in personality research in the area of psychopathology. There are still large gaps in our knowledge about the development of personality, and many more about the aetiology of personality disorder. Although Cloninger's theory does not as yet provide definitive answers in this area, it has the potential to yield many interesting and productive questions which can then be tested against the theoretical base that has been proposed. Questions concerning the aetiology of personality disorder that arise from this work will be discussed within the framework of a diathesis-stress model of mental disorder. From this, implications for treatment will be reviewed with special emphasis on the importance of longitudinal data to clarify the process of normal as well as abnormal personality development. The potential use of the TPQ and the TCI as clinical instruments for the classification of personality will be commented on, before the psychobiological approach's theoretical contribution to the field of psychopathology is evaluated.

2. THE AETIOLOGY OF PERSONALITY DISORDER:

According to the psychobiological model, personality is formed by the interaction of temperament and character. Temperament is proposed to be a result of the genetic inheritance of biochemical mechanisms that control individual responses to novelty, reward and punishment. Character, in contrast, appears to be more dependent on environmental influences, although what these influences are and how they impact on the development of personality are not clearly stated. Cloninger and his associates, like others before them, have hypothesised an important interaction of genes and environment in the development of personality and its related disorders.

These hypotheses fit within the framework of a diathesis-stress conceptualisation of disorder. In other words, personality disorder is hypothesised to be the result of a combination of genetic vulnerability due to extreme temperament traits (diathesis), and environmental stress in the form of negative experiences and/or lack of positive experiences that result in character deficits. The model suggests that it is the inheritance of temperament variables that create a vulnerability to the development of particular types of disorder, rather than the inheritance of genes for the particular disorders themselves. This diathesis may not be restricted to the development of personality disorders alone, in that the phenomenology and course of other Axis I disorders, such as the depressive and anxiety disorders, may also be influenced by inherited temperament variables.

It is possible that many individuals have a genetic vulnerability to certain types of disorders, based on these genetically influenced temperament dimensions. Only a few, however, have the necessary level of vulnerability on this continuum or the particular combination of genetic and environmental influences to develop those disorders. Genetic vulnerability and

environmental stress, while both important to the development of personality disorder, do not appear to be mutually necessary. Cloninger and his colleagues discovered this when their research indicated that not all individuals with extreme temperament profiles were diagnosed as personality disordered (Cloninger et al., 1992). This implies that it is possible for an individual without a genetically mediated temperament vulnerability, as measured by the TCI, to be personality disordered due to the influence of environmentally mediated character variables.

In order to examine such hypotheses, it is important to be able to make a distinction between genes and environment that can be expressed in operational terms. Several investigators have attempted to isolate the genetic influences of personality, but few have been successful. Cloninger and his associates have attempted to do this in their separation of personality into temperament and character, and in their design of the TCI. However, there are also problems with their conceptualisation, and the dilemma of how to determine clearly what is environmentally influenced and what is genetically influenced remains unresolved. For example, do the measures of NS, HA, and RD really measure the genotypic structure of personality as Cloninger has suggested or are they merely representations of the personality phenotype?

Recent trends in psychology have led to an almost universal acceptance of interactional models. Many researchers and theorists have called for the dismissal of the nature-nurture controversy in favour of a more sophisticated approach that can examine interactional effects of the two and their relative influence on various psychological concepts such as personality (Vaillant, 1987). There are several possible interactions involved in the influence of genetics and environment on personality, or in the terms of the psychobiological model, temperament and character. The first of these involves an additive model, where temperament and character are distinct

from each other but combine to form what we know as personality. The second sees character as being formed from temperament traits, that is, as modifications of temperament variables due to the influence of the environment. Finally, temperament and character can be viewed as the products of separate developmental influences, but interacting with each other in a reciprocal way so that each may modify the expression of the other.

It is not clear which of these alternatives matches the psychobiological model best, as the separation of temperament and character is problematic, and the role of the environment, while suggested, is also unclear. It is important to note that this lack of clarity is more likely due to the lack of research conducted in this area, rather than a theoretical oversight. What the model does offer is the opportunity to examine these possibilities further. While it is possible that we may never be able to clearly distinguish between genetic and environmental influences on personality development, the psychobiological model provides the means of testing current hypotheses so that in the future we have a more precise basis from which to make more explicit hypotheses.

In addition, the temperament and character dimensions (as measured by the TCI) may be modified to enable clarification of the distinction between genetic and environmental influences and enhance accurate measurement. For example, the terms NS, HA, and RD, while intuitively appealing to researchers and clinicians, have been problematic in several ways. In particular, the claim that they are genotypic representations of personality structure has been difficult to prove, despite Cloninger's criticism of other personality models for their blurring of the genotype-phenotype distinction. The use of the simpler behaviourally based terms, behavioural activation, inhibition, and maintenance, may have provided a purer conceptualisation of temperament. These terms provide a more parsimonious explanation of the neurochemical and neuroanatomical research, and are more easily converted into measures of

temperament in children and infants. Behavioural maintenance, for example, can be measured in terms of physical response to stimuli, whereas RD is a more complex construct that incorporates variables such as 'sentimentality' which are difficult to observe in young children and more likely to be environmentally influenced.

If temperament is conceived of in these behaviourally based terms, it is possible that NS, HA, and RD may be found to reflect phenotypic variation of these temperamental substrates as represented by the additive model described earlier. The character variables, in contrast, would be more likely to represent the influence of social factors on personality that have developed separately but interact with the temperament variables. Distinctions such as these may help determine the complex process of personality development and their influence on personality pathology.

There is still much research to be done in this area before the impact of personality development on psychopathology can be explicated thoroughly. According to the latest results from Svrakic and his associates (1992), however, self-directedness appears to be a core construct of personality disorder. If this finding can be replicated and is demonstrated to be consistent with research in other areas such as humanistic psychology, it represents an important discovery in the attempt to explain the aetiology of personality disorder. The psychobiological model suggests that personality disorder is determined by character variables that are influenced mainly by the environment, which implies that the environment is a key variable in the development of personality pathology. If character is the most important variable in this process, it is necessary to consider the types of environmental influences that might impact on its development. Used in conjunction with other instruments measuring life events and social relationships, the TCI may be able to determine trends in the development of personality disorders. While in

practical terms this would largely consist of retrospective data gathering, longitudinal studies would also be important to further elucidate these relationships.

3. TREATMENT IMPLICATIONS :

The model implies that while genetic and environmental influences are both important in the development of personality disorder, it is character which determines the presence or absence of such a disorder. If this is true, the psychobiological model has several implications for the treatment of personality disorder. For example, if low SD scores are indeed a core feature of personality disorder it follows that increasing SD should be an important goal of therapy for individuals with these disorders. Given the reliance on humanistic psychology in the description of this concept, this discipline would seem the obvious choice from which to derive appropriate techniques to do so. However, humanistic approaches to the treatment of personality disorder have not appeared to have had any greater success than other approaches, making this hypothesis problematic.

It is possible that these approaches have not been researched with personality disordered patients, hence there being no mention of its success. A more likely explanation, however, is that while SD is an important component of personality disorder presentation it is unlikely to be the only facet that requires attention. In addition, although touching on this area, humanistic therapy may not have had the necessary specificity concerning this concept. Therefore while increasing self-directedness may benefit from the incorporation of certain therapeutic techniques from the area of humanistic

psychology, a more integrated approach to therapy using techniques from other disciplines may be more appropriate to deal with the complex presentation of personality disordered clients. It is unlikely that any one treatment approach holds all the answers in the search for effective treatment options for the personality disorders. The findings of Cloninger and his associates suggest that while SD should be viewed as an important component of treatment, the integration of other approaches is also necessary, and that such integration should be based on the individual's temperament profile and character variation.

Including information about personality problems that are based on temperament extremes Cloninger et al. (1992) suggest, raises the possibility of using behavioural and pharmacological interventions. By focusing on basic responses to environmental stimuli, such interventions would hope to modify the inherited response biases that are proposed to be causally influenced by such temperament extremes. The treatment of character difficulties, in contrast, would necessitate a different approach due to the differing developmental influences involved. Cloninger et al. (1992) suggest many different psychological treatments that may be useful in the development of character. For example, they state that cognitive -behavioural techniques may be useful in the facilitation of self-directed behaviour, Rogerian counselling techniques to develop an acceptance of others, and the use of Jungian analysis as a means to attain self-transcendence. Such hypotheses are speculative, however, and Cloninger and his associates acknowledge the need for more research in the area of the interaction between drugs and psychosocial interventions in the treatment of personality disorder.

If the developmental aspects of the model can be clarified, the psychobiological model also has implications for the prevention of personality disorder. If specific or general influences on character development can be

defined that are found to be associated with personality disorder, it may be possible to design interventions at an early stage to minimise the risk of disorder developing. For example, research literature on the effects of sexual abuse in childhood has found that incest is often associated with a disturbance in the child's development of his or her self concept, which can result in difficulties in the areas of self-definition, self-integration, and self-regulation (Cole & Putman, 1992). Related to these difficulties are problems establishing a sense of security and trust in social relationships. These authors suggest that a history of childhood sexual abuse is common in those with personality disorders. Incest, therefore, may be one example of the effects of negative environmental influences on character development. A possible application of Cloninger's TCI is to help discover differences between those with a history of sexual abuse who also have high scores on self-directedness and those who do not. In this way it may be possible to determine environmental experiences that may mediate the negative influences of sexual abuse on character development.

In order to improve treatment options for personality disordered individuals and establish prevention programs for those at risk, longitudinal studies are needed to clarify the development of personality itself. Such studies need to incorporate measures of both temperament and character in order to gauge the relative influence of each on normal development. In doing so it may be possible to determine those features of personality development that are disrupted in individuals with personality disorders. At the same time, longitudinal studies using the TCI would allow further examination of the personality stability argument, and verify whether SD and C scores do increase over the life span. If so this would fit with the hypothesis that personality disorder often decreases as an individual ages and provide further implications for preventative measures and treatment goals.

4. POTENTIAL FOR CLINICAL USE:

While the areas of aetiology and treatment of personality disorder remain largely untested and unproven, research interest in the classification and diagnosis of these disorders has resulted in major improvements over the last decade. This area is still problematic, however, and many believe that the conceptualisation of these disorders requires a fresh approach. The psychobiological theory and the TCI may aid in improving the diagnosis and assessment of personality in the clinical setting.

One of the most important assets of the psychobiological model is its provision of a dimensional framework by which to view personality in psychopathology. The psychobiological model, by using a dimensional system, incorporates both normal and abnormal personality, and enables more precise measurement of personality information relevant to the individual. The dimensional profile for each individual provides both qualitative and quantitative information, much of which would be lost in a categorical system. In this way the psychobiological model enables the gathering of personality information that is relevant to diagnosis and treatment, which might otherwise be neglected because it does not meet criteria for a categorical diagnosis.

As well as document information about personality pathology, the TCI is also able to gather information about the more positive aspects of personality. The influence of personality strengths on the diagnosis and treatment of psychopathology has not received much attention in the literature and clinical instruments such as the MMPI are utilised largely for their interpretation of personality abnormalities. A lack of adequate measures available to record information about personality strengths is one possible explanation for the lack of research in this area, but is also likely to be the result of a historical

focus on personality deficits and the lack of integration of research on normal personality. Use of the TCI in clinical research and practice would enable this important area to be researched further. For example, if personality profiles according to the TCI can be related to treatment outcome in terms of strengths and deficits, this would have important implications for the aetiology and treatment of mental disorders.

Use of information from a dimensional model in the classification of personality disorder may also prompt new perspectives in other areas, such as the evaluation of treatment outcome. The effectiveness of personality disorder treatment has largely been considered in terms of success or failure. Dimensional measures of treatment outcome that record the degree of improvement or deterioration across a variety of measures may be more useful at this stage of our knowledge about treatment. In this way, it would be possible to determine which treatments were relatively more effective so that they may be further developed, rather than all treatments being categorically deemed unsuccessful and as such discarded. At the same time, it would enable more precise measurement of the effect of personality weaknesses and strengths on outcome measures.

Within this dimensional framework, Cloninger proposed that NS, HA, and RD follow a normal distribution in the general population, with the majority of individuals having intermediate values on each. He described the concept of an intermediate adaptive optimum, whereby those with intermediate values are able to adapt better to different environmental situations than those with extreme scores. The new character dimensions, however, do not appear to fit this curvilinear representation, based on results from Svrakic and his associates most recent study (1992). It appears that the higher the individual's scores on these dimensions (that is, the more extreme they are in a positive direction), the less likely they are to have a personality disorder.

Extremely high scores on the character dimensions, however, may also be maladaptive and should not be taken in isolation. It is possible that an individual with an extremely high self-directedness score and a low cooperativeness score may have a diagnosis of antisocial personality disorder. Similarly, an individual with an extremely high cooperativeness score and a low self-directedness score may show signs of dependent personality disorder. These hypotheses need to be tested in the future so that the relevance of the whole profile in the diagnosis of personality disorder is clarified in addition to that of one dimension in isolation.

Based on our present level of knowledge, the TCI has been demonstrated to provide an impressive predictor of personality disorder diagnosis. Based on the level of self-directedness and cooperativeness, Svrakic and his associates have discovered a non-specific indicator of personality disorder that with further testing, may prove to be a key concept for this type of disorder. In addition, the temperament measures give some indication of what type of personality disorder is appropriate. The authors of the instrument claim that subtyping of specific disorders according to their temperament dimensions is also possible. However, even the less bold and more accurate suggestion that clusters A, B, and C tend to be represented by low RD, high NS and high HA, is an important finding.

A self report measure such as the TCI, which can obtain such information relatively quickly and efficiently, provides an excellent screening measure from which to further investigate personality in a clinical setting. Ben-Porath and Waller (1992) provide some guidelines as to the basic tasks required of instruments used in clinical personality assessment. They discuss the importance of determining protocol validity, the need for a description of stable personality patterns as well as current level of adjustment, and the provision of information relevant to diagnosis and treatment. Based on these

considerations they conclude that instruments designed specifically for the assessment of personality in disordered populations such as the MCMI-II (Millon, 1987) and the MMPI-II (Butcher et al., 1989), provide the most useful assessments instruments in this area.

When measured against these criteria the TCI has several potential advantages and disadvantages, which will be determined by the results of further research. It has already been shown to have potential in the area of diagnosis, and the theory it is based on provides some interesting alternatives for treatment. It is unclear whether the TCI provides a stable measure of personality or whether it is affected by current mental state. In addition, it does not provide any validity scales, which may compromise its usefulness in psychiatric populations. What the TCI has done, however, is match the descriptive based classification system that is in general use to a new theoretical foundation that can begin to find answers to the more difficult questions of aetiology and treatment.

Several other modifications and clarifications are needed before the use of the TCI can become widespread. One of the most important of these is to establish adequate norms for psychiatric populations. Related to this is the need for the development of explicit means to determine cut off points for high and low scores on the different dimensions. As mentioned earlier, at present it is unclear whether to use population means from the normative data provided by Cloninger et al. (1991), to use those from the sample being studied, or to preset an arbitrary cut off point. Research data from both general and specific population samples is required before these questions can be answered adequately and it can be accepted as a valid measurement in clinical settings.

Once the TCI has been thoroughly researched, modified, and perhaps had a

validity scale added, we will be better able to determine its usefulness in a clinical setting. For now, however, we can consider its potential usefulness and speculate on further modifications. One such possibility involves the conversion of the TPQ to provide an observer-rated measure, which is also being acknowledged to be an important part of any personality assessment (Ben-Porath & Waller, 1992). The TCI with its emphasis on personal beliefs and experiences may be more difficult to rate as an informant measure, but it may be possible to rate the concepts according to how they may affect an individuals outward manifestation of personality. For example, self-directedness may be measured according to observations of goal directed behaviour.

At this point of its development, however, the TCI measures provide clear and precise information about personality features that might otherwise be overlooked in a general assessment. The instrument is relatively easy to administer and score, and provides operationally defined and quantifiable measures of theoretically grounded concepts that hold the potential for communicating knowledge relevant to the treatment and course of particular disorders.

5. THEORETICAL CONTRIBUTION:

From a theoretical viewpoint, the psychobiological approach to personality and its disorders has several important contributions to make to the development of this field. Cloninger and his associates have attempted to explain the basic structure of individual personality differences and commonalities. They have integrated large amounts of information into one

theoretical framework and have provided guidelines for the measurement of the constructs involved. In doing so, they have stimulated further hypotheses that can be investigated in order to improve our understanding of this complex area. As has been highlighted throughout this thesis, the model still has many gaps and limitations that prevent a wholesale acceptance of its theoretical basis. These difficulties, however, do not so much detract from the model's theoretical usefulness, as highlight those areas which need more research attention.

One limitation of the theory results from the attempt to integrate large amounts of information from widely disparate fields of research into one multifaceted theory of personality. Such a goal is admirable and is becoming an increasingly popular course in theoretical investigations. In this case, however, it appears that with the incorporation of more perspectives, some of the theoretical clarity of the original theory has been lost. For example, theoretical concepts from areas such as humanistic psychology have been incorporated without full acknowledgment of the issues and controversies that have important implications for the psychobiological model. In other cases, as Eysenck (1988) has suggested, citation of the literature has been not only selective but also careless in the interpretation of studies to fit the theory. While the theory incorporates an extremely broad area of information relevant to personality, the explanation and perhaps even the understanding of that information has sometimes been neglected. As a result, important parts of the theory may prove to be simplistic as in the case of the neurotransmitters' relation to the temperament dimensions, or arbitrary as the original rationale for choosing three dimensions appears.

The expansion of the model to include seven dimensions, where previously it had been argued that three was sufficient, effectively negated part of the rationale for the early theory. As a result of further testing which

demonstrated that persistence was independently heritable from reward dependence, this dimension was incorporated into the model as a distinct fourth temperament variable. Yet the initial theory had no rationale as to why this should be so, and with the recent addition of three new character dimensions, persistence appears to have been neglected.

Previously, the three original temperament dimensions had been presented with a description of their characteristic presentation, hypotheses about the neural pathways involved and were placed within an ethological hierarchy of development (Cloninger, 1986; Cloninger & Gilligan, 1987). Later, the character variables were also fully described according to a neuroanatomically based memory system and descriptive literature from humanistic psychology (Cloninger et al., 1992). Persistence, however, has had no detailed explanation and as such it is difficult to determine its relevance to the model. It does not appear to fit with the rest of the model or add anything to the theoretical conceptualisation of personality structure and development. It is clear that this dimension requires further exploratory work to determine its nature and usefulness within the psychobiological model.

When Cloninger first presented his thoughts in this area, he introduced them as a theory of personality. In this most recent presentation, however, the theory has been relabelled as a model. Whether this change was made deliberately and for what reasons is unclear. However, it can be argued that a model makes less of a claim than a theory does in terms of its explanatory power or inherent correctness of interpretation, and as such is more easily modified in response to research findings and criticism. It is possible that Cloninger and his associates, realising the gaps and limitations in their model, are subtly acknowledging the work that needs to be done before the theoretical base can be more firmly established. The new model is as much a theory as the original theory was, but the relabelling may give it the

appearance of more flexibility should further modifications be necessary in the future.

While there are many issues that need to be addressed and examined in terms of their implications for the psychobiological model, it should be emphasised that the theory is still very young. As such it is understandable that its presentation has been simplified in order to catch the attention of researchers and clinicians. As further research is conducted and comment is obtained from those working in other fields, the psychobiological model will be criticised, and as a result clarified.

Perhaps the greatest strength of the model, however, is its capacity to stimulate research and debate in the area of personality in psychopathology. Cloninger and his colleagues have supplied researchers with measures and concepts by which to explore many different avenues. All over the world groups are using the TPQ to study the influence of personality on different areas of psychopathology, including Japan, Italy, Sweden, and the former Yugoslavia, as well as America, Australia and New Zealand. Once the TCI is published it is likely that it will encourage further research on the model which will eventually provide us with a better understanding of the complex nature of personality structure and its pathology.

As an example of the kind of information that can be gained using the TPQ, the following is a brief review of a recent study carried out with eating disordered individuals (Bulik, Sullivan, Weltzin, McKee, & Kaye, 1992). These researchers demonstrated that by using TPQ scores it was possible to distinguish between certain subgroups of individuals with eating disorders that would otherwise be categorised together. The only significant differences between groups when each dimension was considered in isolation were found for the RD total and two NS subscales. However, when the group profiles

across the three dimensions were examined several important differences were discovered.

Normal weight bulimic women with no history of anorexia nervosa were found to be characterised by personality styles that included high NS scores (eg. explosive). In contrast, women with current bulimia and anorexia nervosa clustered in personality styles that were characterised by high HA (eg. obsessive), and those with restrictor anorexia nervosa were identified by high RD scores (eg. cyclothymic). Based on these and other personality measures Bulik et al. were able to accurately predict which diagnostic group women belonged to. They concluded that personality differences may provide an important means of distinguishing subgroups of women with eating disorders and yield interesting answers as to personality vulnerabilities in the development of different eating disorders.

This study is just one example of many research projects currently being conducted using measures from the psychobiological model. Each will need to be replicated and there is no doubt that many will find limitations in the model proposed. As they accumulate, however, the theoretical and practical utility of the model will become clearer. In the above example, important information has been discovered which has the capability of reshaping our understanding of the role of personality in the development of eating disorders and optimal treatments for them. Such research provides exciting new directions for further investigations using this model.

The majority of research to date has come from psychiatrists and has been published in psychiatric journals. With the recent changes to include more psychological perspectives, however, it is likely that psychologists may become more involved in testing the theory in the future. The areas of cognitive psychology, learning approaches, humanistic psychology, and

personality development, all have expertise that can help clarify the theoretical roots of the psychobiological model.

While the psychobiological model is not the only one from which we can further investigate the role of personality in psychopathology, it is nonetheless making an important theoretical contribution to this area that cannot be ignored. Few personality theorists have managed to merge normal and abnormal personality structure adequately into a coherent framework that provides the means to explore connections between these two areas. In doing so they are prompting a change in conceptual focus, as personality information per se becomes as important as information about personality pathology.

The level of research interest in this model will ensure that its contribution will continue into the future. There is no doubt that parts of the model will prove to be inaccurate, but in the process of being proved false essential information will have been gained. Whatever we learn from the psychobiological model, it is clear that it will provide new impetus by which we can advance our understanding in an area that has been known more for its semantic gymnastics and fragmentation, than the innovation, progress, and integration that this model promises.

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